A Direction FOR Tomorrow

Emergency's advisors' predictions for what EMS might be in 1999

BY KATY BENSON

In August we sent a one-page questionnaire to the 41 members of Emergency's *advisory board. They were to pick from a list the three topics they saw undergoing the greatest change, facing the fiercest debate or having the biggest effect on EMS before 1999. They were also invited to suggest their own issues. We then asked them to expand on one or more of the topics and, if they had expertise in a specialized area of EMS, to share their view of its future development, problems and solutions.*

Twenty-five of 41 advisors responded, either in writing or in a phone interview. Their views of the future of EMS well from diverse waters within emergency and pre-hospital medical care. Their ranks embrace EMTs, paramedics, emergency nurses, flight nurses, emergency physicians, medical directors, pharmacologists, administrators, instructors, professors, ambulance providers and fire personnel. Their answers reveal deep concern for the profession, the people working in it and the patients they serve.

The responding advisors are listed here (see page 8 for the complete advisory board and their affiliations), along with a tally of topics they believe are key to EMS as we enter the 21st century. A few advisors checked off more than three issues, and a few named issues not included in the list.

Responding Advisors

Richard Clinchy, PhD, CHT, REMT-P
Ellen C. Corey, MD
Dana Cox, RN, CEN, CCRN
Kevin Crawford, EMT-P
Carol A. Cunningham, MD, FACEP
Brent H. Dierking, BS, REMT-P
Robert E. Dooley, JD
Nabil El Sanadi, MD, FACEP, MBA
Leah J. Heimbach, RN, REMT-P
Deborah Hypes, EMT
Richard Judd, PhD, EMSI, NREMT-A
Sheri King, MD, FACEP
David B. Levy, PharmD, EMT-P
William E. McConnell, DO, FACEP
William R. Metcalf
Jonathan G. Newman, REMT-P
James L. Paturas, EMT-P
Michael P. Peppers, PharmD
Lou E. Romig, MD, FAAP
Bruce R. Shade, EMT-P
Vincent P. Verdile, MD
Bradford L. Walters, MD, FACEP
Brian S. Watson
Michael J. Werdmann, MD, FACEP
Michael S. Williams, MA, EMT

Advisors' Key Issues in EMS

15	Health care reform
9	Scope of practice
7	Funding
6	Research
4	EMS for children
4	Licensure
4	Personal safety
4	Private vs. municipal services
4	Technology
4	Curriculum
4	Legal issues
3	Career development
3	Urban/gang violence
3	EMS leadership
2	Higher education
2	Rural EMS
2	EMS in fire service
2	Domestic violence
2	Standards
2	Geriatrics
1	Hazardous materials
1	Work force


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The future of EMS takes shape as a giant question mark, due to the unknown variables of the health care reform equation. Fifteen responding advisors marked reform as a leading issue, and several said that what emerges in that arena cannot be separated from the future of other issues, such as scope of practice, funding and research.

"Issues such as licensure, rural EMS, career development and so forth are all going to be driven by the changes in the health care system," wrote William Metcalf, a policy director with the American College of Emergency Physicians (ACEP), commenting on the difficulty of predicting EMS in 1999. "Kind of like trying to pick out the tires for a new car when you're not sure whether it's going to be a NASCAR race car or a family sedan."

Other top-ranked areas of change or debate also will influence or react to a range of issues, advisors say. Funding affects technology, which can effect change in education and rural care. Research can help secure funding. Scope of practice has consequences in career development and legal issues. Litigation may spur research, and so on.

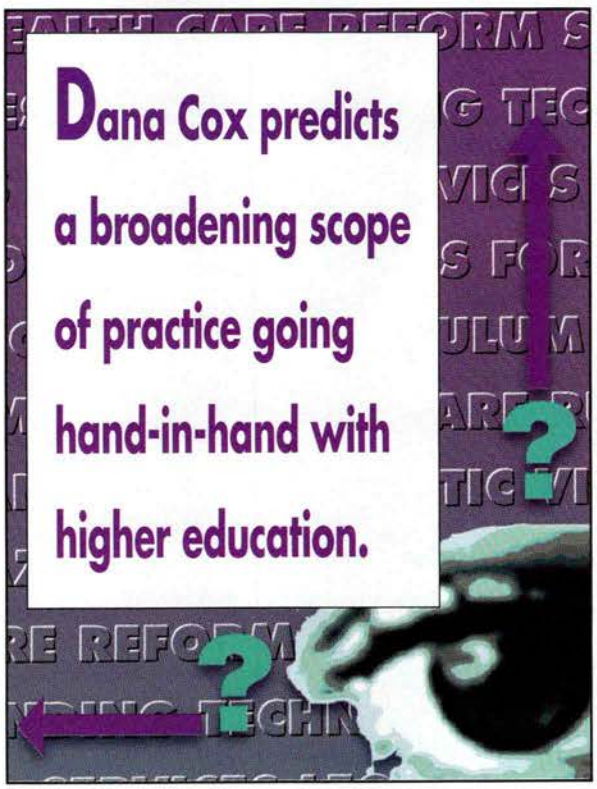
While respondents mark a clear hot spot for the future, they also stretch the spectrum in identifying areas in which they expect growth, decline or heated discussion. One conflict in particular arises from their points of view: Several advisors see the pre-hospital role expanding, including mobile primary care and more advanced procedures done in the field; others, though, foresee a shrinking scope of practice due to research results, such as shortening time in the field for certain cases, or due to reform-based regulations.

Topics are broken out here, with representative comments (where more than one advisor took the same angle) as well as diverging points of view. In some cases, related topics have been lumped together to accommodate a more balanced discussion.

Emergency would like to thank each of the respondents for taking time to peer into the future from his or her unique vantage point. Together, these ideas have created a vision of EMS both sobering (we're not in the catbird seat yet) and giddy (but we're reaching pinnacles). Many men and women have invested their lives bringing emergency medicine and pre-hospital care to the level it has achieved today. Here, the advisory board gives all of us a direction for tomorrow.

Health Care Reform

Advisor surveys and interviews came in just before and just after President Clinton introduced the First Lady's health care reform package. At the time of this writing, no policy is yet certain—perhaps the reason the subject looms so large in everyone's mind.



Leah Heimbach, who gained early access to the plan, found few mentions of EMS in it. "By not including how EMS fits into the big picture, it may come up after the fact," she says. "We need to take steps to make sure we're considered in all aspects of care. It's not an option—squad people have to get involved, or they'll go out of business." As chief administrative officer for the Center for Rural Emergency Medicine, she fears exclusion would excessively hurt rural EMS systems.

Lou Romig, a physician in the Miami Children's Hospital emergency division, has the same concern about EMS for children (EMSC). An EMSC report issued this summer stresses the need for a continuum of care in handling children's medical emergencies—but if pre-hospital services aren't included in a reform plan, providers will be hard-pressed to stake their claim in reimbursements. "If we're going to develop a continuum of care, we're going to have to campaign for our share," Romig warns.

Carlsbad, Calif., Fire Battalion Chief Brian Watson isn't surprised the Clinton plan neglected EMS, because it's an "infinitesimal part of health care costs." Nevertheless, getting it addressed is crucial. He sees health maintenance organizations (HMOs) competing with EMS services by making a rule that patients call the HMO before calling 911, to determine if the situation is a true emergency. "The result could be a funding squeeze to maintain the emergency ready-to-serve resources because the 'semi-emergency' transports are handled by the HMOs," he writes.

Reform is driving an issue debated for years, according to James Paturas, EMS director for Bridgeport Hospital in Connecticut. Research and the need to prove pre-hospital care makes a difference. With EMS funding earmarked in the medical arena, for example, "we will be competing with doctors and hospitals. What we do will have to be based on sound information proving medical and cost effectiveness."

In Dr. William McConnell's opinion, a monetary pinch will lead to regionalization of EMS care. Extra regulations associated with managed care could "dictate to which hospital patients will go," writes Dr. Nabil El Sanadi. "This will lead to undue burdens on EMS traveling longer distances with sicker patients."

Others, too, see funds declining under reform. The focus will shift from trauma and emergency care to prevention, according to Dr. Ellen Corey. Yet this could pave the way for EMS providers to take on an expanded role as

"physician extenders" in areas such as immunization.

"It would be foolish of the Clinton administration not to consider EMS for preventive care," says Bruce Shade, EMS commissioner for Cleveland.

Florida has already launched reform, having received approval to do health care purchasing. State EMS Director Michael Williams describes it as "a big Medicare system for the state, with EMS part of the system." Florida is reputed to have the highest transport collection rate in the country—an astounding (but unverified) 70 percent. The nationwide average, according to Williams, is closer to 40 percent. Depending on how reimbursement is handled, he foresees the possibility that a nationwide system would "turn into chaos." With government reimbursement, all of a sudden there will be money to be made in EMS, and the competition will grow cutthroat, Williams fears.

However United States health care delivery changes shape, it will have unprecedented impact on EMS care, Metcalf believes—reform has the potential to redefine EMS. "Even if the government initiative completely falls apart, I am absolutely convinced that the business/industrial community in the country is going to cause a change in the system anyway," he says.

Scope of Practice

A large part of what could undergo transformation is the practice of EMS, including the range of services as well as treatment given in the field. "We are already seeing expanded use of pre-hospital providers in the emergency department and other hospital areas," Metcalf says. "I expect that we will also see new opportunities show up in the primary-care arena."

Advisor Richard Clinchy and Joe Ryan, EMS medical director for Pinellas County, Fla., have been pursuing a concept Clinchy refers to as "Medic Mobiles"—roving, primary-care units staffed by specially trained paramedics to serve the medically indigent, homeless and homebound elderly patient. According to Williams, a group of paramedics has received 1,000 hours of specialized training to respond to these non-emergency calls, thus unclogging the "real" EMS system for true emergencies.

Clinchy, who has applied to the federal government for a seed grant, sees an additional benefit: a new role for the older paramedic, who can put years of experience and education to more advanced use while easing up on the physical demands of being on the street.

A second long-anticipated development is now in the pilot-test stage and could bear on the pre-hospital scope of practice for the 21st century. The EMT-Basic curriculum is in the latter stages of revision by the Department of Transportation (DOT). Advisors discuss its ramifications in more detail in the **Education** section of this article; for this discussion, be aware that it changes the pre-hospital role from diagnostic to assessment and gives EMTs training in procedures formerly approved only for paramedics.

Dana Cox, an air-ambulance nurse, predicts a broadening scope of practice going hand-in-hand with higher education, more responsibility and more autonomy from doctors and nurses. This will have both negative and positive impacts on providers. "It adds stress and may weed out people who are dabbling," she says. "But it's gratifying to be making decisions rather than feeling like a robot."

Cities scraping the bottom of their coffers will be unwilling to support higher levels of capability. "The last thing they want is for the EMS agency to come in and say, 'We're not paramedics now, we're superparamedics, and we want more money,'" he says.

As more research is conducted, it is certain to force changes in practice—but different advisors see it going different ways. McConnell and Brent Dierking talk about the trend in EMS toward "less is more," with an emphasis on quicker transport to definitive care rather than on more advanced field treatment. Asked if he finds it discouraging to think of not being able to fully employ his paramedic skills, Dierking answers, "Certainly it is. But the question we all have to come to grips with is, does it [a particular treatment] do any good?"

In some cases research may prove that time-honored practices don't do much good. But in other cases, it can provide proof in favor of early and advanced intervention. The Journal of the American Medical Association recently published two papers showing that in more than 99.5 percent of incidents it's useless to deliver to the hospital cardiac arrest patients who could not be revived in the field. Those results suggest the absolute importance of quick response and a highly trained pre-hospital team.

Jonathan Newman, a paramedic and medical student, talks about the progress being made in synthetic blood and what effect it could have in pre-hospital care of heart attack victims. What if paramedics could give patients oxygen-rich artificial blood that also removed carbon dioxide, thus preventing shock? Wouldn't that buy the patient invaluable time in the four-hour survival window? Wouldn't it benefit both the patient and the ED staff to give paramedics equipment and training to do this?

Scope of practice ultimately turns on providers' ability to "demonstrate clearly the improvement in [decreasing] mortality and morbidity that accompanies more appropriate pre-hospital intervention," McConnell writes. He refers to trauma care, but many advisors offer the same thought about all pre-hospital care.

Research

EMS research must move into the field—everyone who talks about research is adamant on this. Explaining why, Paturas says, "Paramedics and EMTs know what's happening on the street. And the results affect them, so they must understand the need for research, the process and the results."

Dr. Michael Peppers, a pharmacologist, links advances in drugs and communications to research. But first, he writes, "EMS providers will have to take active roles in research design and implementation to justify the importance of, and help define new avenues for, technological advances."

Funding

The motivation to gather scientific proof will be, at least in part, money. Metcalf says, "A significant component of a reformed system is going to be a different approach to how we decide what is done and not done for patients. ... The emphasis will be on paying for services and treatment that have proven efficacy." This has serious implications in a field where little can be proved to be cost effective, he adds.

Dr. Michael Werdmann of Bridgeport Hospital in Connecticut sees pre-hospital care moving from a public utility model to

a medical model—a concern if, under health care reform, pre-hospital care becomes part of the hospital expense. "That puts EMS into significant competition for that money," he says. "Hospitals are a very strong contender for administering payment, and unless a hospital runs an EMS program, it may have a bias against supporting ALS unless there's compelling data to prove outcomes depend on it. And EMS doesn't have that kind of data."

EMS providers, especially public providers, will step up efforts in "creative financing," predicts Kevin Crawford, a fire captain/paramedic in Carlsbad, Calif. That includes elaborate fee schedules, subscriptions and raised fees, as well as staff and function changes such as browning out units to fill gaps. If EMS funds come largely from transport reimbursements, fire/EMS departments that treat patients but let an ambulance transport them may get into the transport business, too.

"The posture of EMS is changing because of funding," Crawford says. If the budget crisis continues for several years, the level of pre-hospital care will eventually suffer, too, he fears. "If the budget picks up, hopefully we'll be able to get back to a true service-oriented complexion."

Technology

"Technology will dictate many changes in pre-hospital care," Newman says. He feels the last 20 years of work on synthetic blood is about to yield results. Advances in communication technology could let paramedics linked to the medical director via camera and radio equipment administer blood IVs and use 12-lead ECGs.

"With the advent of drugs that act rapidly to save a life when administered in a short window of time, technological advances in cellular communications and mobile intensive care units will probably be in the foreground," Peppers says. He cites recent research in thrombolytics and magnesium therapy, as well as efforts to transmit ECGs across airwaves. In addition, paramedics may be more highly trained to analyze ECGs in the field. "This can be extremely exciting for rural EMS, where the patient may be as far as 60 minutes away from the nearest health care facility," Peppers says.

Private vs. Municipal Services

Municipalities are at a crossroads, according to Williams. "They have to decide if they can afford and want to provide EMS, or if it's more effective to contract for services." If the competition among private, fire, hospital and third-service providers gets as ugly as he predicted earlier, the private sector may be best poised to take advantage, due to the economies of scale of serving multiple jurisdictions. However, he notes, for-profit services may not be the most cost-effective answer, as many are subsidized; and many fire and third-service providers are already collecting fees from users. Still, "fire departments traditionally are not set up to bill, and will have to rethink all this," he says.

Cox believes, to the contrary, that rising costs will lead fire departments, many of which already have an EMS role, to become more active in its delivery.

Brent Dierking, operations manager of a private ambulance company in Mississippi, predicts 1999 will find fewer than a dozen large ambulance providers dominating pre-hospital care in the United States. "Privatization meets most EMS needs," he says.

Health care reform will so severely restrict reimbursement from insurance companies that municipalities will be forced out of EMS, Dooley suggests. "They can tax but the double-whammy is the tax base is shrinking. The easiest way to go is private." Private companies will grow more efficient with leaner ALS fleets in service.

"The government has declared a certain amount of patient care can be sacrificed in the name of efficiency," Dooley says.

The fight for transport and ALS reimbursement that health care reform is likely to spark will cause contention between private and public providers, Watson says. "There are solutions, but public and private providers have to talk about it."

Legal Issues

"Federal health care regulations are going to explode," Dooley says. "Many things left to medical judgment now will be regulated." They will stipulate, for example, that all patients with certain signs or symptoms must have BLS transport and go to a specific hospital. In another example, a paramedic might want to have a syringe ready with lidocaine in case a patient needs it; but unless it's actually administered, insurance won't reimburse for it.

A couple of advisors mentioned the need for EMS providers to protect themselves against increasing litigation. Dr. Carol Cunningham claims lawsuits against providers in Ohio have leaped 500 percent in two years. "The importance of good documentation on run reports cannot be overemphasized," she says. Patients' vital signs should be reassessed and recorded every five to 10 minutes, and the report must include lack of symptoms. It should also document problems, such as prolonged on-scene time or difficult intubation.

Clinchy recalls a recent lawsuit filed against a paramedic. The medic had filled out an incident report, but two weeks later the case was still bothering him, so he wrote out a narrative of what happened. When a lawsuit was filed, he was interviewed by phone and the tape transcribed. Placed side by side, the three accounts were "a nightmare of gaping holes and inconsistencies," Clinchy says.

"Curriculum doesn't go into documentation repeatedly or in detail," he continues. Cunningham is trying to acquaint paramedics with the need for documentation as well as key words and ideas by putting them through mock depositions. In the future, she feels, training must include more coverage of legal issues.

Personal Safety

Two issues dominate this topic: bloodborne pathogens and violence.

"We will see pre-hospital providers taking a different approach to assessment because of the violence they face," Shade says. "The other side of it is the personal trauma they endure when responding to an emergency due to violence. They might see a person with five to 30 holes in them because of the weapons out there. This plays heavy on their minds."

Both kinds of risk require extra or new garb for protection. Providers have been inundated with new state and federal laws in the past year, according to Crawford. Yet street workers have been slow to accept necessary measures. The solution, Shade says, is "a matter of training, policy and enforcement. We have to get people to internalize and believe in the need to wear protective gear," whether it's bullet-proof vests, helmets or latex gloves. One area he expects to see

advances in is protective clothing adapted to EMS needs so that it is part of everyday wear.

Crawford reports that the Carlsbad Fire Department has taken a tiered approach to protecting against bloodborne diseases. If a call involves a high degree of exposure to bodily fluids, the responders wear a highly protective outfit. Lesser threats of exposure call for different garb such as gloves and face shields.

EMS for Children (EMSC)

"Pediatric EMS has a bright future," Romig declares. "We're returning to a teamwork concept—pediatrics recognizes its role in EMS, and EMS sees its role in pediatrics."

The source of excitement is a report issued last summer by a 19-member panel that studied EMSC for two years. While it identifies appalling shortfalls in care for children, it also lays out a comprehensive plan for getting up to speed over the next decade.

"This is a white paper for EMSC," Romig says. "It puts it all in one place where it will reach a broader audience." If its recommendations are taken to heart, training, provision, care and equipment will be integrated into EMS as a whole. A continuum of services will deal not only with emergency care, but with prevention and rehabilitation. EMSC training, already widely available, will be further enhanced by a national, standardized EMSC course for paramedics.

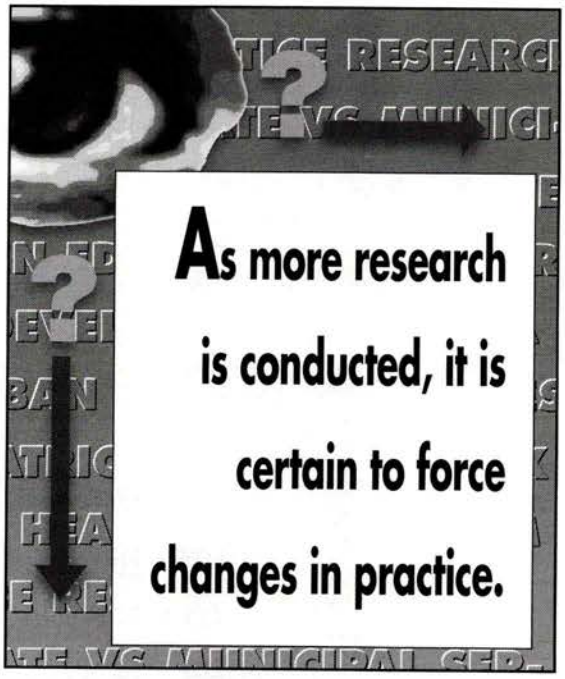
Education and Curriculum

The first step into the future must be to "develop an understanding between the medical and pre-hospital communities about what pre-hospital is," Shade says. "We have to decide if EMS is going to require more of providers than the basic EMT course [teaches]." And if EMTs will be required to get more education, how will that affect volunteers, who comprise a majority of EMS providers? We need to look realistically at keeping volunteers in the provider network, Shade believes.

The DOT's new EMT-Basic curriculum, currently being tested in Pittsburgh and Montana, moves away from diagnostic toward assessment, "quite a big shift," Professor Richard Judd says. "It will change how we start." A National EMS Training Blueprint Project report, published in draft form last summer, recommends that the pre-hospital curriculum include 15 core elements of progressively increasing knowledge and skills. This could mean radical changes in how EMTs learn, advance in the profession and practice.

Peppers predicts curriculums increasingly will be part of two-year degree programs and eventually four-year degree programs. With EMS practice and standards being challenged as they are, degrees will be "absolutely necessary to the industry," he says.

Improved technology will expand avenues to college education via computers, Clinchy believes. He writes, "It is imperative that, with the ever-increasing cost of education, we continue to explore more ways to keep the cost of college education for the EMS professional affordable and as accessible as possible."



Career Development

Recognizing the need for upward mobility in EMS will lead progressive systems to diversify the work place, Dierking believes. "A stable work force is necessary for EMS to grow as a profession," he says. But to keep employees the industry will have to help them develop within the profession and outside it. It's not good business to lose the most highly trained personnel to burnout.

Dierking estimates his company loses two people per month who decide to pursue something else, such as a nursing degree. "These people have additional knowledge and experience—why can't we try to keep them?" he asks. "We could involve them in more clinical areas, such as quality assurance or critical care transport." The future provider will have a good human resources department.

Shade sees increased interest in licensure, but doesn't know "how much of it is legitimate desire to make change, or just talking about it once again." The overriding need is for paramedics and EMTs to have mobility among states.

Trauma Care

"I believe we will see continued efforts to shorten field time and minimize pre-hospital intervention in trauma victims," McConnell writes. "This will create significant problems for providers who will feel they have been trained to do things they are no longer allowed to do."

Cunningham, however, sees indications of just the opposite happening, and its coming about as a result of regional trauma care. Under a plan discussed in Ohio, patients will no longer be transported to the nearest hospital but to the appropriate hospital. "The ED physician will rely more on the paramedic's report from the field to direct the patient to the right place," she says. This could result in more assessment responsibilities in the field.

Rural EMS

This has been a popular issue among pre-hospital providers and will continue to be so, Heimbach says. Outlying systems will be integrated with metropolitan ones and in that way bring about consistency in care and delivery.

The Center for Rural Emergency Medicine, where Heimbach works, has just received a private foundation grant for $780,000 over three years. The monies will pay for hooking up a computer bulletin board and software that will give the center access to the same information that urban systems have, as well

(Continued on page 63)

HERE COMES

Solar energy for emergency medical and disaster use

BY CHRISTOPHER ROSS, RN

All over Africa, the Philippines, across New Guinea and other remote locations, delicate medicines and vaccines stay as stable as they would in a major urban hospital—thanks to the sun and the thousands of medical refrigerators it powers throughout the world.

Not only refrigeration is run by the sun—whole clinics depend on solar energy to power ECG and X-ray machines, copiers, lighting systems and nearly everything else a well-equipped facility requires. In Zaire, a project known as ISROS includes nearly 100 separate systems of many sizes and degrees of sophistication. Elsewhere in the less developed areas of the world, communication links, navigation aids and airport lights are powered by quiet, reliable solar panels. In Central America, for example, the Wagner foundation donated six portable beacon lights to medical personnel in Belize and Guatemala for use when helicopter medical evacuations are required in isolated villages.

When power lines aren't available to tie into, or when they fail, solar energy is far cheaper and more reliable.

Solar power isn't used only, or even principally, in the third world. When Hurricane Andrew demolished commercial power systems in South Florida during August of 1992, members of the Florida Solar Energy Center and Sandia National Laboratories quickly moved in portable solar systems to power numerous clinics and medical facilities. In churches, schools and refugee centers, wherever medical care was provided, either generators or solar energy was providing the power. When Kauai was hit by Hurricane Iniki, emergency communications and drinking water were suddenly dependent on the only power left intact—the housetop solar panels that survived the storms.

Emergency response trailers, which include solar arrays on the roof and storage batteries with backup propane generators and automatic controls, are now available to be flown anywhere in the world where instant, reliable power is needed. They are being purchased by cities, civil defense groups, state agencies and private groups alike. They can be deployed in less than 30 minutes. When Hurricane Hugo hit South Carolina in 1989, such a system was immediately put to use to power law enforcement and traffic facilities, and even an orphanage. Other

(Continued from page 33)
as interaction with experts in medicine and management. "The thrust is to bring rural squads to the proficiency level of metropolitan squads," she says. Rural EMS is emphasized as a distinct subset of EMS for children in the newly released EMSC report, according to Romig.

Urban, Gang and Domestic Violence

As was mentioned in the **Personal Safety** section, violence increasingly intrudes into the pre-hospital provider's job. Crawford describes a "wave of relativism sweeping the country, causing a breakdown of the social fiber. And all that comes back to us."

Heimbach, noting a federal push to address domestic violence, sees EMS playing a bigger role. "EMS is often the first one on the scene of a domestic-violence call," she says. "Now we may be the one to give the woman a phone number to call. We may be expected to know more and to intercede more." This will be especially true in rural areas, where the EMT may be the victim's only contact with a health care professional.

Geriatrics

"Geriatrics will continue to impact EMS, at least through 2010," Judd says. The 85-and-older age group is the fastest growing segment of the population, according to the 1990 census, and oldsters require both emergency and urgent care.

Dr. Vincent Verdile notes "persistently high morbidity and mortality from injury and trauma" among the older population. These factors will lead to "more emphasis and funding for trauma/geriatric care with large federal initiatives to support EMS development in these areas."

Hazardous Materials

Haz mat transport and storage proliferation will mandate that EMS know more about toxic substances, according to El Sanadi. The solution will be to include haz mat education and training in standard EMT and paramedic classes.

Work Force

With health care reform and consolidation of health care systems will come changes in the work force, Paturas predicts. "Studies indicate there could be as much as a 25 percent reduction in personnel," he says. The industry will see more of a shift, rather than a loss in jobs. With talk on the horizon of primary care paramedics, personnel may move into outpatient centers or into hospitals.

Leadership

"Everything on the list will still be an issue in 1999," Paturas says. "No matter what the issue, it will require more definitive leadership." He's talking about peer leaders, those who have come up through the ranks. Now these individuals need to be identified, nurtured and guided through a process of education. Only with true leaders can EMS clear its own path and make its own decisions. **E**

Katy Benson is a free-lance writer based in San Diego, California, and a frequent contributor to Emergency.

THOMAS H. SWAN, NREMT-P

Jumping through hoops

A few years ago, Mike, a paramedic co-worker of mine, moved from a large city to a small, rural community to escape the hassles and high rent common to big city life. Since he wanted to become involved in his new community as soon as possible, he applied for membership with the local volunteer ambulance service.

Mike came to work a few days later thoroughly disgusted, frustrated and angry. "They want me to go through a probationary period and an orientation course, and even then they'll only let me practice at an EMT-Basic level," he said as we were inspecting our ambulance. "I've been a paramedic in this state for more than 10 years," he continued. "I've got a hundred ideas for ways they can improve their service. You'd think they'd jump at an opportunity to provide a higher level of care. Well, to hell with them."

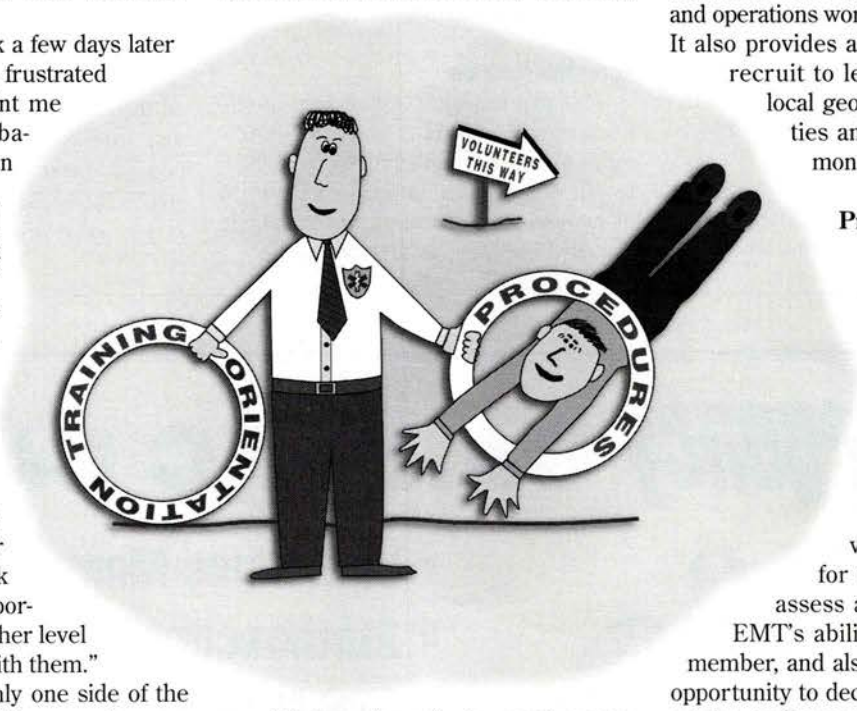
Though I heard only one side of the story, I do know that Mike never became a member of that volunteer ambulance service, and I strongly suspect the members of that small service were glad he didn't. Mike wasn't even willing to try to prove his ability to be an effective part of the local patient care team.

Most volunteer EMS services have some specific procedures new recruits must follow in order to become members of a department. They are generally designed to protect the agency from potential legal problems and to ensure the new volunteer knows how to operate the department's vehicles and equipment safely and properly. Most importantly, these procedures help ensure that new recruits can function as effective team members on emergency calls.

If you are planning to move to a new community and want to join its local EMS department, you should be prepared to jump through a few hoops. Some of the more common membership procedures are described below.

Formal Application for Membership

Nearly all volunteer departments require new recruits to fill out a written application form, even if they've already provided a résumé. In most cases, recruits are also asked to provide copies of their valid state driver's license, EMT or paramedic certificate and documentation of previous training. Stringent federal and state occupational safety and health regulations may require documentation of training in emergency vehicle operations, bloodborne pathogens and hazardous materials awareness.



Orientation to the Department

Many agencies require new recruits to receive a formal orientation, supervised by a current volunteer or officer. Generally, new volunteer orientation courses include a review of the department's policies, procedures, medical protocols and written standing orders, and its facilities, vehicles, equipment and supplies. Since each department is unique, the orientation provides the new volunteer an opportunity to learn how that particular department does things.

As a part of the orientation process, new recruits may also be required to respond to a specified number of calls (generally between five and 10) as an observer. This allows new volunteers to learn how the department's procedures and operations work in real-life situations. It also provides an opportunity for the recruit to learn a little bit about local geography, medical facilities and types of calls common to that area.

Probationary Period

Once new volunteers have completed the orientation process, some departments also require them to complete a probationary period, generally lasting three to six months. This provides an opportunity for current members to assess and evaluate the new EMT's ability to work as a team member, and also gives the recruit an opportunity to decide whether or not he or she really wants to be a part of the organization.

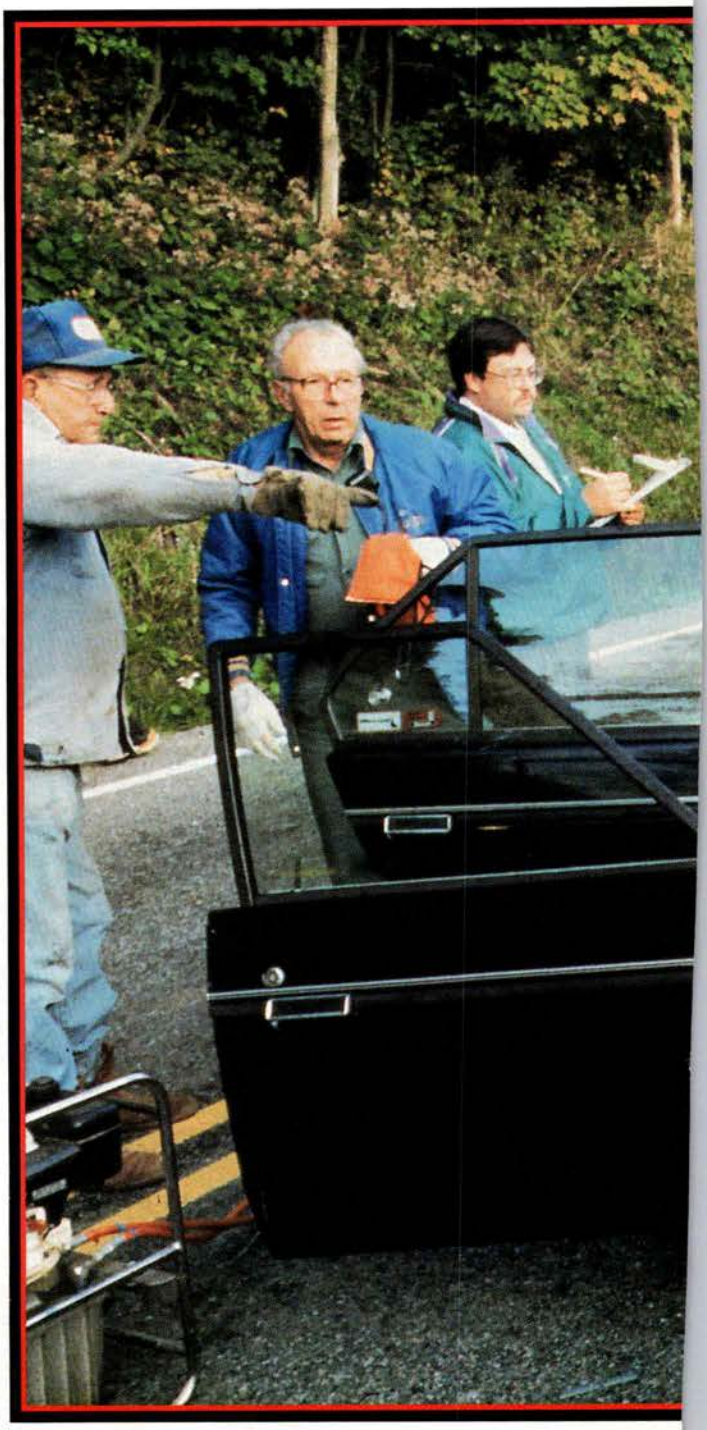
Some volunteer departments, especially those with extremely low call volumes, require probationary volunteers to attend all regularly scheduled educational and training meetings during the probationary period. This helps new recruits learn procedures unique to the department and gives as many current members as possible a chance to meet and work with the new volunteer.

Other Procedures

Physical agility testing, designed to ensure new volunteers are able to perform job-related tasks, is a common requirement in many areas. Generally, these tests are related only to the actual

The New

Is EMS another fire to be fought, or is it strictly a private matter?



This past summer, Framingham, Mass., faced a problem shared by many other municipalities. It was pressed for money. The fire department, which also provided the city's only pre-hospital medical care and transport, stood to lose 18 positions. Twenty had already been sacrificed to two previous budget cuts, according to Chief Michael Smith.

Meanwhile, a few private ambulance companies had been taking over pre-hospital duties in surrounding small communities. With each "acquisition" (ambulance services are exempt from bidding in Massachusetts, says one provider), they reached a greater economy of scale. They still collected a stipend from towns toward unpaid transports, however.

small, sharp items are placed in heavy plastic tubes with tight-fitting end caps. Larger knives and sharp items are secured in cardboard boxes or tightly sandwiched between sheets of heavy cardboard. Clothing, paper items, swabs and so forth, once air dried, are placed in either a plastic bag and marked as biohazardous, or in the familiar red biohazard bag and then sealed.

Evidence regularly attaches itself to a patient as he or she is transported. Inspection of stretchers, rigs or bedding can reveal items such as jewelry, change, identification, broken knife blades and bullets that have hitched a ride. If lodged just under the skin, bullets can pass through it during transport and fall out.

Make a Detailed Report

The increase in violent crime coupled with faster and more professional emergency medical response has generated a greater expectation for EMS providers to be witnesses to statements or activity. Responders can arrive on scene, begin treatment and transport the patient before the first officer arrives. The patient can make statements to responders that can have great bearing on the investigation. This can be especially true should the patient die prior to a formal police interview. Here, accurate notes and reports will be valuable. Similarly, witnesses (even potential suspects) can make comments to the medical crew that can be important to investigators. Responders' observations also are important. Should an automobile accident be DUI related, notes about the scene can serve to identify who was driving.

The investigators' access to reports will often depend on privacy laws and the kinds of records. Medical records such as ED charts will usually be unavailable unless under subpoena or, as in Florida, when there's a death investigation and the medical examiner is involved. Run reports, which are administrative documents, can be considered public records under state law. Personal notes can be considered work products and depend on state laws and rules of evidence as to whether or not they're accessible. To avoid disputes between investigative and rescue agencies, interagency understandings should be established and used to guide personnel in handling issues on scene.

At times, EMS providers can become more involved in an investigation than just by providing medical care. A court order for blood can find a paramedic drawing it in lieu of a hospital phlebotomist. In Florida, state law provides that blood alcohol samples can be drawn during the investigation of a wreck involving injuries, and that this blood can be drawn by any of several medical practitioners, including paramedics. Again, it is important that the practitioner document the nature of the activity.

Law enforcement must handle a "chain of evidence." This refers to the need for proper identification and documentation from start to finish. Although from a legal standpoint the chain applies only to the criminal justice system, an officer must document where evidence was obtained. Furthermore, when someone from outside criminal justice takes action on behalf of an officer, that individual's actions must be documented as part of the chain. If the officer does not document the identity of the nurse who collected material for a sex-crime kit or the paramedic who drew blood in a DUI investigation, the evidence could be excluded at the trial. The nurse or medic should also initial or sign blood vials, packages, envelopes and other packaging involved so that the individual can identify the collected materials at the trial.

Far too often, responders arrive on scenes where control has not been fully established. Although many jurisdictions have protocols that prevent a unit from arriving at certain violent or potentially violent scenes before police, others don't. Even when such a procedure is in effect, routine calls can suddenly thrust first responders into dangerous situations.

When this occurs, their first actions will be dictated by local protocols. During that time, responders should be acutely aware of all incident activity— first, to ensure their safety and that of the patient, and second, to document the incident. In situations like this, the rescuers have sometimes become patients, and law enforcement agencies end up working for them as well.

Tell the Truth

At some point EMS providers can expect to get involved in the court system. It might be criminal court, relating their role in a criminal investigation, or civil court, providing information to determine fault and economic responsibility. It will include various appearances in court or quasi-court situations including hearings, depositions and trials.

The most important advice that can be given to any witness is to tell the truth. Provide it as simply as possible and only relate what can be accurately reported. Avoid volunteering information or expounding on a theme. If an attorney is dissatisfied with an answer, he will elicit a more complete response. A witness must also realize it is not necessary to know all the answers. If you don't know, say so. If you don't remember—cases often take a year or more to go to trial—say so. If you can refresh your recollection from reports or notes, explain that to the attorney. Despite our impression from television to the contrary, attorneys will not usually try to attack third-party witnesses. If you come across professionally, with honesty and integrity, the attorney will generally not want to degrade you, since this may weaken his or her position with the jury or judge. Also remember that you are at a trial to provide information to the jury, and you should direct your answers to them. This may feel uncomfortable, answering not the questioner but a third party, but they are your audience. The attorney usually knows the answer already.

Be Cooperative

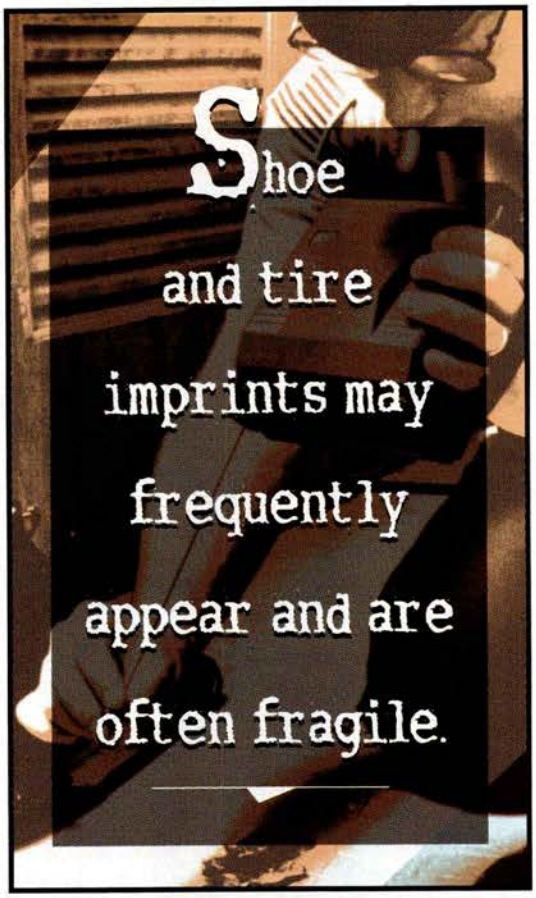
Criminal activity, and even just the litigious nature of our society, has placed the EMS provider in a position to deal with physical and testimonial evidence as a routine matter. Preparing to handle these situations will allow you to operate in a more cooperative atmosphere with the criminal justice practitioner. Too often, because of a lack of understanding of each other's jobs, petty rivalries erupt that prevent working together. Yet cooperation must occur to ensure that our shared constituency receives the best treatment from both systems. E

Sgt. Paul R. Laska is currently with the Martin County Sheriff's office in Stuart, Fla. He is also a member of the International Association for Identification, the International Association of Bomb Technicians and Investigators, and of the International Association of Arson Investigators. He teaches at the Indian River Community College in Ft. Pierce, Fla., as well as instructing various police, fire and EMS organizations in Florida's Treasure Coast area.

Because of the importance evidence has taken on, it is crucial that EMS providers recognize and understand the basic principles of evidence protection. Obviously this doesn't mean patient care should be sacrificed for investigative demands, but evidence should be preserved whenever possible.

Watch Your Step

Protection of evidence at a crime scene begins upon arrival. Shoe and tire imprints may frequently appear and are often fragile. If at all possible, avoid taking the response vehicle off the paved road. When you enter the scene on foot, choose and follow one route. Haphazard approaches merely act to multiply the possibility that evidence will be damaged or destroyed.



When entering a structure, vehicle or scene, limit touching surfaces or moving items unless necessary. Fingerprint evidence is especially delicate. Gloves might protect from depositing new prints, but can destroy valuable ridge detail or whole prints, and can even transfer the wearer's fingerprint impression to other surfaces.

The rescue team may have to move some things to operate effectively. The keys here are care and documentation. If a table must be moved, try pushing it with your shoe or pants leg, or place your hands farther under it than normal. At the same time, be aware of hair and fibers, as these can be strong items of evidence. Bullets and cartridge casings are important, relatively fragile and easily overlooked.

Documentation of items is a must. When EMS providers are trying to preserve a life, however, there is no time to photograph a scene, sketch the items' locations and develop copious notes. Yet during customary note taking, simple references should be made as to what was handled, roughly where it was originally and where it was moved. This provides information that may be pertinent to an investigation.

Be Weapon Wary

Weapons pose additional problems. Blunt, edged or pointed objects and firearms may contain secondary evidence such as fingerprints, hair, fibers or blood. Their placement may be important to the investigation's accuracy. Finally, a firearm *must* be assumed to be loaded, and unless you are familiar with firearm safety, a police officer should be the one to remove it.

If you decide to move a weapon, carefully do so by hand. Lifting a firearm by the trigger guard is relatively safe. Heavily checkered or crosshatched parts of the stock or grips can be touched with minimal concern for fingerprint damage. Details of the weapon's original location should also be provided to investigators.

A case in point was a suicide investigation in which the first deputy sheriff on the scene found the subject lying on a bed, a gunshot wound to the head, while the only firearm at the scene, a rifle, was lying on a chair in an adjacent room. The initial investigation quickly took a wrong turn, until investigators called the crew back to the scene to explain their actions. They had removed the weapon, not to examine the patient (they already had determined he was dead) but to protect against an accidental discharge.

When removing clothing from a patient, cut around or away from holes or damage in the fabric whenever possible. It may be easiest to slice the buttons from the front of a shirt or blouse. Again, document what action was taken, thus allowing the investigators to draw correct conclusions. Often, a hole is from a bullet or knife, and cutting away clothing destroys valuable evidence.

Use Biohazard Precautions

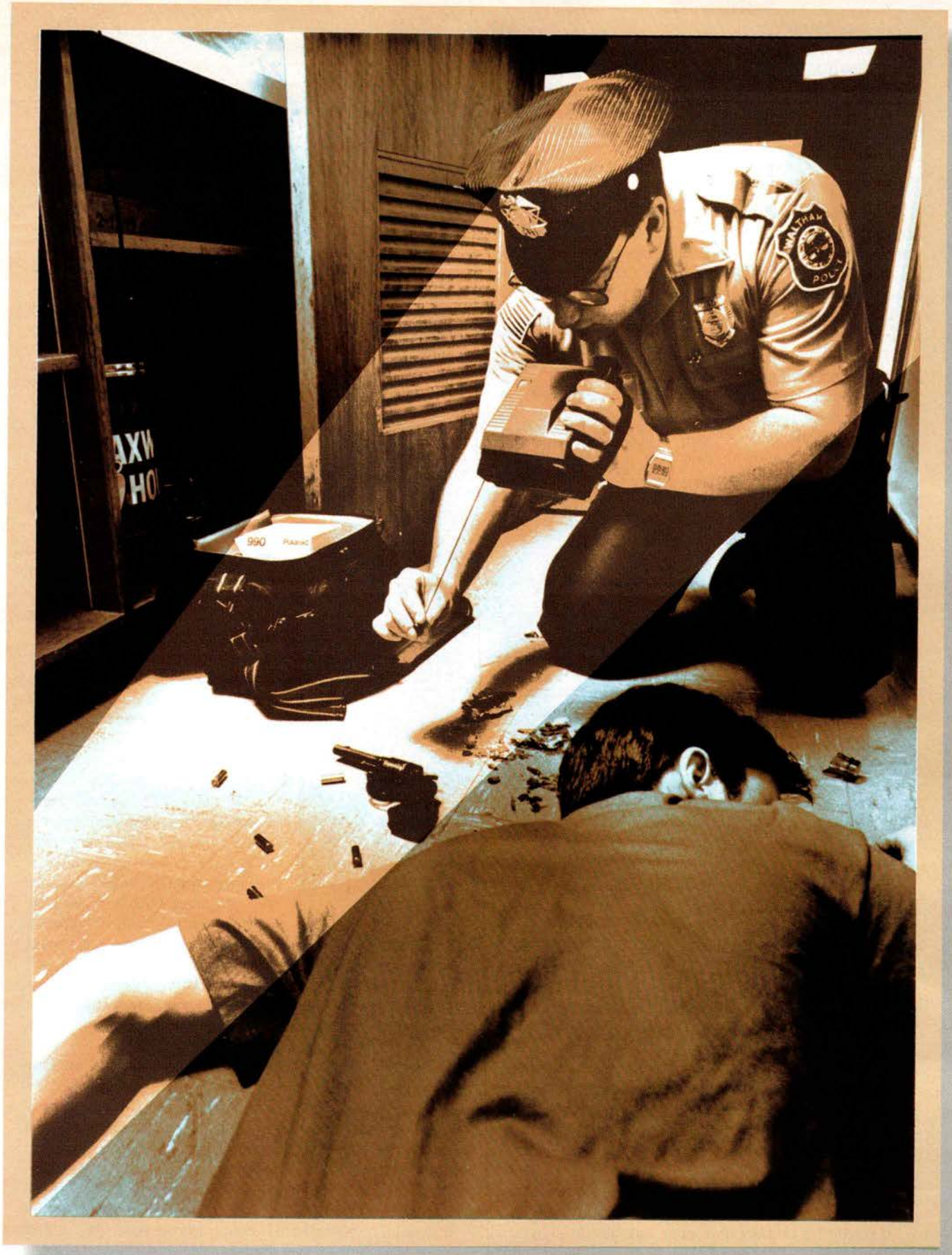
Bloody clothing presents serious problems. Blood that cannot air dry will putrefy, ruining it as evidence and causing a biological hazard. Generally, EMS and ED personnel use plastic bags for collecting "refuse" such as clothing. For the sake of criminal investigations, however, such bags should not be sealed and should be turned over to an investigator as soon as possible. If local protocol requires the bags be sealed, be sure to notify the investigator about the presence of wet blood.

CPR, defibrillation and other lifesaving acts will sometimes leave bruises or marks behind that could easily steer an investigator wrong. Consider an infant, transported by EMS providers while in respiratory arrest from SIDS. Without sufficient communication between responders and police, the bruising that appears on the child's chest, and possible broken ribs due to CPR, could be mistaken for signs of physical abuse. Simple documentation provided in the run report, and communication with the investigators, can avoid a faulty assumption being made.

Some medical artifacts are quite obvious. ECG monitor pads, endotracheal tubes and IV lines will generally be conspicuous. However, in some instances, the patient may already be under medical treatment. Again, documentation of actions taken and of conditions as first observed will assist in properly reviewing the situation.

Medical waste generated by EMS personnel is now usually collected at the scene and disposed of as biohazardous material. Providers should ensure that the waste they collect is theirs and not some of what was already part of the scene.

Biohazardous evidence collected by investigators is preserved in various containers. Syringes, small knives and other



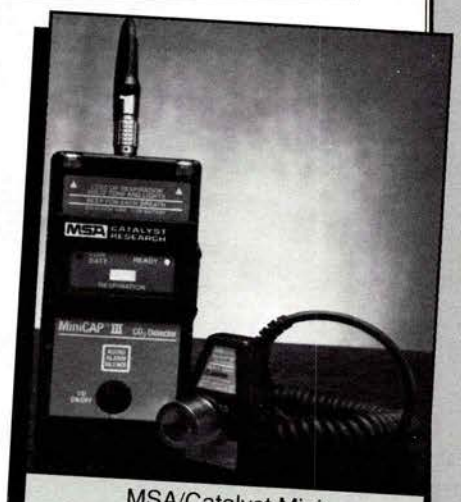
EMS providers must take care to preserve and protect crime scene evidence so that it may be properly documented by investigators.

Electronic CO_2 Monitors

Coming on quickly and expected to be as widely used as pulse oximeters in a couple of years are electronic carbon dioxide (CO_2) monitors. Nellcor, for example, recently received federal 510K clearance for a small, handheld CO_2 device that it plans to call the N-60. It looks almost identical to the N-20, and when used with an N-20 it will allow the paramedic to look at perfusion and ventilation at the same time.

One of the first companies to come out with a portable electronic CO_2 monitor for ALS use is MSA/Catalyst Research. Their MiniCAP III is primarily used by paramedics to check for correct intubation—if you have CO_2 coming out of an endotracheal tube, there's a good chance the tube has been properly placed.

The MiniCAP III uses infrared absorption spectrometry technology to detect CO_2. The sensor attaches directly to the artificial airway via an adapter, runs on two C-cell batteries, and provides both visual and audible tones and alarms for respiration rate and loss of respiration. The whole package is less than six inches high and weighs less than 15 ounces.



MSA/Catalyst Mini Cap III CO_2 Monitor

Stylettes and Endotracheal Tubes

Rounding out the ALS equipment review for 1993 are modified versions of a couple of products that have been around for some time. The first is an improved lighted stylette manufactured by Aaron Medical Industries.

While lighted stylettes are certainly not new to ALS, Dr. Scott Polsky, director of EMS for Akron City Hospital, Akron, Ohio, mentioned a new version put on the market by Aaron Medical Industries as being particularly useful for pre-hospital situations.

Unlike other stylettes that are typically 25cm long, Aaron Medical's version is 40cm in length, making it suitable for any size endotracheal (ET) tube from a 6.5 all the way up to a 10. "It's bright enough to work in full daylight," said Polsky, "and it frees the medics from having to cut down the ET tubes to make the stylette fit.

And finally there is the Combitube, a patented esophagotracheal double-lumen airway produced by Sheridan Catheter of Argyle, N.Y. The Combitube can be placed in a patient without the use of a laryngoscope or blade and handle. According to the manufacturer, regardless of esophageal or tracheal placement, the device is able to establish a patent airway because of its design. A number of states have approved the Combitube for ALS use, and the American Society of Anesthesiology has identified it as a product for establishment of a non-surgical airway during difficult intubation.


Sheridan Combitube Esophagotracheal Double-Lumen Airway

Saving Lives Is the Bottom Line

The goal of all these improvements in defibrillators, ECGs and respiratory gas monitors is to help decrease the time it takes to administer advanced life support to patients. In the old days, ALS was performed in the hospital since only the hospital had the necessary equipment and trained personnel to do the job properly. With advances in computer intelligence, many sophisticated functions can now be automated and built in to equipment that is small enough, light enough and rugged enough to be used in a field environment. As this year's ALS equipment survey has shown, the trend toward bringing hospital ALS capabilities into the field is well under way.

Bob Bruce is a free-lance writer based in Newberg, Oregon.

Scene of the Crime

Steps to Preserve and Document Evidence for Investigations

Violent crime has extended its reach into communities of all sizes. It has made its way from the urban centers into suburbia and even rural areas. With this growth has come a greater role for EMS units in dealing with traumatic injuries. Responders in even the smallest communities, where total volunteer response is the norm, are finding themselves routinely involved in criminal investigations. In addition, their actions may have important effects during law enforcement investigations.

During the past 30 years, physical evidence has taken on much greater importance during criminal investigations. Generally considered an outgrowth of court decisions that limited the role of confessions during the 1950s and 1960s, this increased reliance on physical evidence has significantly improved the quality of investigations. The voluntary nature of a confession is easily challenged by the defense during a prosecution, and the lack of witnesses or living victims may hinder an investigation. Physical evidence, on the other hand, stands on its own and always presents documentation for analysts to interpret.

BY PAUL R. LASKA

Taking all this information, anticipating death at a future date, discounting for present values, building in assumptions for inflation on the needed dollars, and making a series of sophisticated calculations relative to the actual amounts received from Social Security, the analysis estimates that the paramedic should own $254,000 of additional life insurance. Don't stop reading now, that really isn't an expensive amount of insurance protection at today's prices!

Now let's take a look at a simple approach to solving the same problem:

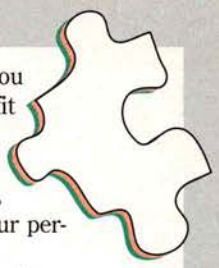
Cash needs at death:	
Emergency fund	$10,000
Funeral costs	$4,000
Current bills	$3,000
Children's education ($60,000 X 3)	$180,000
Mortgage balance	$55,000
Total cash needs at death:	$252,000
Existing resources at death:	
Savings	$2,500
Investments	$5,000
Existing insurance	$75,000
Total resources at death:	$82,500
Cash needs at death	$169,500
Combined income of client and spouse	$44,100
Income needed after client's death (65 percent)	$29,000
Average annual Social Security	$8,000
Spouse's annual income	$14,000
Additional income needed after client's death	$7,000

If we divide this income shortage of $7,000 by the assumed investment return rate of 6 percent, it would take $117,000 of additional cash at the client's death to yield $7,000 in annual income.

If we add that $117,000 to the cash need amount of $169,500, the total comes to $286,500. Not too far from the $254,000 amount derived from a complicated nine-page analysis that in all probability is fully understood only by the financial planner! From a pragmatic standpoint, the client will probably be advised to purchase a nice round number of insurance like $250,000 in either event.

What kind of life insurance?

Three types of insurance will probably be presented to you as a solution to your needs: whole life, universal or variable life, and term. There are many times the financial planner may provide you with a mixture of insurance products to fit your insurance needs, but the solution should focus on your budget. How much can you afford to spend on a regular basis, long-term, for this essential keystone to your personal financial plan?



Whole life insurance is a policy that provides protection for life and a premium that essentially remains the same for your entire life. Policies may be non-participating (paying no dividends) or participating (paying dividends), and these policies have internal reserve build-ups called cash values, which are sometimes misconstrued as the investment aspect of the policy. Though they are cash and constitute an asset to you during your lifetime, they really aren't an investment in the truest sense since they evaporate at death. During your life, you can withdraw or take loans

(Continued on page 90)

TABLE 2

Your current income/year	$_____	(A)
Your spouse's current income/year	$_____	(B)
Total yearly household income (Total of A + B)	$_____	(C)
Income needed at death (0.6 X C)	$_____	(D)
Assumed average Social Security/year	$ 9,000	(E)
Spouse's income from above	$_____	(B)
Additional income needed (D – E – B)	$_____	(F)*

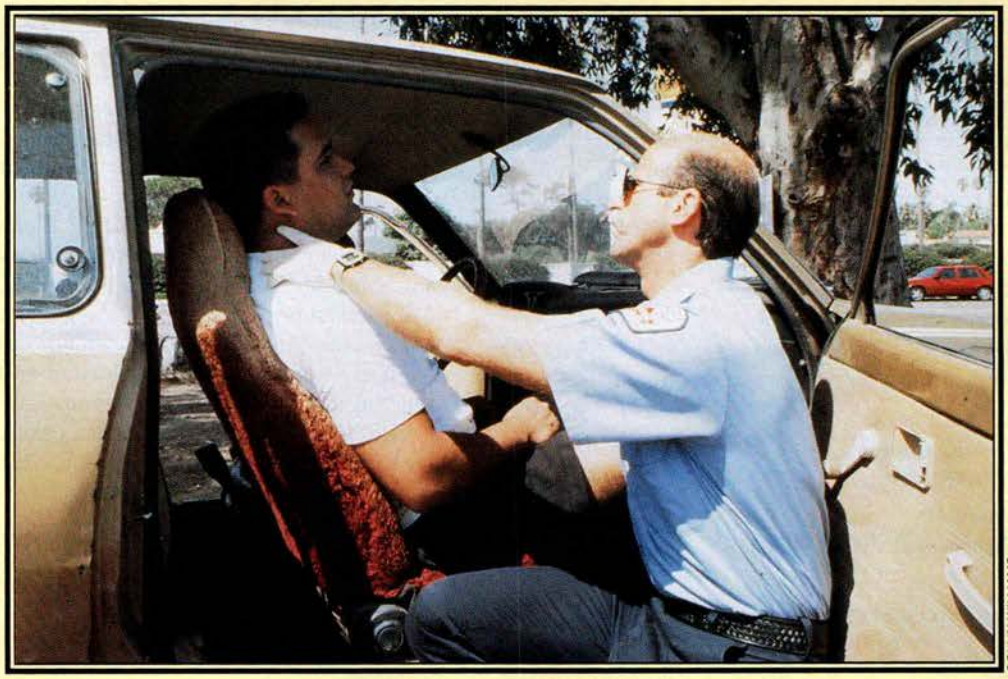
*If this amount is zero or less, enter zero and skip to Cash needs.

Income deficit replacement (20 X F)	$_____	(G)**

**Same as dividing income deficit by an assumed interest rate of 5 percent.

Cash needs:		
Mortgage balance	$_____	(H)
Education fund		
_____# of children X $40,000	$_____	(I)
Total of all other debts	$_____	(J)
Emergency fund	$ 10,000	(K)
Total cash needs (H + I + J + K)	$_____	(L)
TOTAL NEEDS (G + L)	$_____	(M)
Current resources:		
Amount of all life insurance	$_____	(N)
Total other cash assets	$_____	(O)
TOTAL RESOURCES (N + O)	$_____	(P)
NEW LIFE INSURANCE NEEDED (M – P)	$_____	(Q)

Monthly amount you can afford for new insurance ☐ $50 ☐ $75 ☐ $100



COLLIN WILLIAMS

One of the first skills taught to all emergency responders is how to evaluate the patient and the scene of a medical emergency. When I took my first EMT class 13 years ago, I remember making myself a cue card of the questions I was supposed to ask the patient or bystanders in order to understand what was occurring. Most emergency response books are fairly consistent in what questions they recommend.

The normal routine goes something like this. First, introduce yourself and ask the patient's name and age. Find out what the chief complaint is and where the patient hurts. Try to determine the mechanism of injury. Find out if the patient has any medical problems or allergies. Determine the level of consciousness and try to find out if the patient has been unconscious at any time. Get additional information from witnesses and bystanders.

Emergency responders are taught to ask the same questions on every call. The information gained, along with examination of the patient, are usually enough to determine what happened and what should be done.

Usually, but not always. It doesn't take long in the field to realize that many calls do not go by the book. Many traps await the EMT or paramedic who cannot think beyond his or her programmed list of questions when the need arises. Sometimes the key to understanding the situation is to ask something outside your usual routine.

How often, for example, have you asked the question, "When did the accident happen?" In

GETTING THE

most cases, it will be obvious the accident happened immediately prior to the call for help. This is not always the case. I've been caught twice by this assumption. In both cases, it changed the patient assessment once the question was asked. On one call, a girl had been hit in the head by a softball. When we arrived, she was complaining of a severe headache and had an elevated blood pressure, but otherwise seemed all right. Only as we were moving her to the ambulance did one of the coaches say, "Did you tell them I gave her a Tylenol?" Since we were on the scene within three minutes of the 911 call, we asked when the medication was given. "Oh, around 45 minutes ago, right after she got hit," the coach replied. "She was knocked down, but was able to get up and start playing again. After about 45 minutes, she said her head was really hurting, and she couldn't see straight. So we called you." Needless to say, this information changed our evaluation and treatment of this patient.

Another question that might be overlooked is, "What is the patient normally like?" This must be asked of reliable witnesses. It works best when focused on specific behaviors. ("Does he normally hold his head this way?" "Is she usually able to walk without help?") I will always remember the case of the woman who fainted at a card game among her friends. The patient had a history of stroke. When I asked her a question, she calmly motioned to her friend, who said nonchalantly, "She can't talk." The assumption could be made that this woman's normal state included an inability to speak. So it was a surprise when I asked. "How long has she been unable to speak?" and was told, "Oh, about 10 minutes or so, I guess. Ever since she fainted."

Some patients may have physical or mental disabilities that are not obvious in the aftermath of an accident. The observant first responder will be aware of deafness, blindness or language limitations. Other conditions, however, may be more subtle. If in doubt, ask for clarification.

In the aftermath of an accident, the goal is to find out what happened. This, however, is usually a difficult question to ask the patient. Patients who are well enough to answer your question are usually well enough to be worrying about liability. When asked, "What happened?" many accident victims will begin recounting details and rationale for what they did. This can delay treatment and confuse the scene. It is better to ask specifically for the information you really want.

Ask direct, narrowly focused questions to elicit short, clear answers. Instead of asking, "What happened?" try, "How fast were you going? What direction were you traveling? Were you the driver of the car?" Ask questions to help you build a clear picture of what happened.

When the victim of an accident is found in a place you would not expect, ask the patient how he or she got there. The patient may have walked, been carried, or been thrown by the force of the accident. If the patient doesn't remember, this is an indication that he or she may have lost consciousness. When trying to determine if there was a loss of consciousness at some point during the incident, the question, "Were you unconscious?" may not always bring the most accurate results. If a patient expresses doubt about his or her level of consciousness, try asking, "Do you remember everything that happened?" This clarifies any lapses and how long the lapses may have lasted.

Bystanders can provide important information for scene evaluation. Unfortunately, they are also good at misleading emergency responders if they are not questioned with care. The most important first question to ask any bystander is if he or she witnessed the incident. Many bystanders arrive after the fact and are only repeating hearsay. If a bystander is giving information about the patient, ask what relationship that person has to the patient. A spouse is a better source of medical history than a casual acquaintance. Identifying family members early is important, especially if consent is a factor in treating the patient.

Many bystanders will want to help at the scene and may already be doing first aid when emergency services arrive. Try to identify which of the bystanders have the skills to really help you and the patient. Tactfully remove others from the scene. Don't be fooled by official-looking jackets or cars with lights on them. Ask, "Are you an EMT or a paramedic?" rather than, "Do you know how to do first aid?" Nearly everyone believes he or she has some knowledge of first aid. Protect your patient and yourself by clearly identifying the skill levels of bystanders you may use to help.

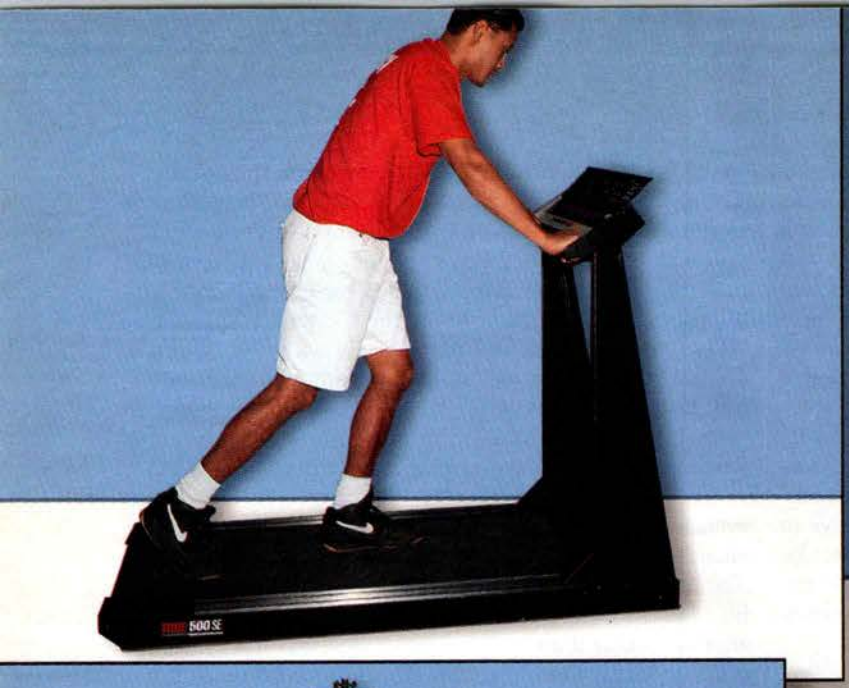
Patient interviews and scene evaluations are standard aspects of every emergency medical response. It is good to have a standard list of questions in mind for every scene. Even so, don't let your routine questions become so canned you overlook questions that may give you the key to understanding and handling some of your most challenging calls.

Ask direct, narrowly focused questions to elicit short, clear answers.

Linda F. Willing is a lieutenant with the Boulder (Colo.) Fire Department. She has been an EMT-A since 1979 and is a former EMT instructor.

WHOLE STORY

BY LINDA F. WILLING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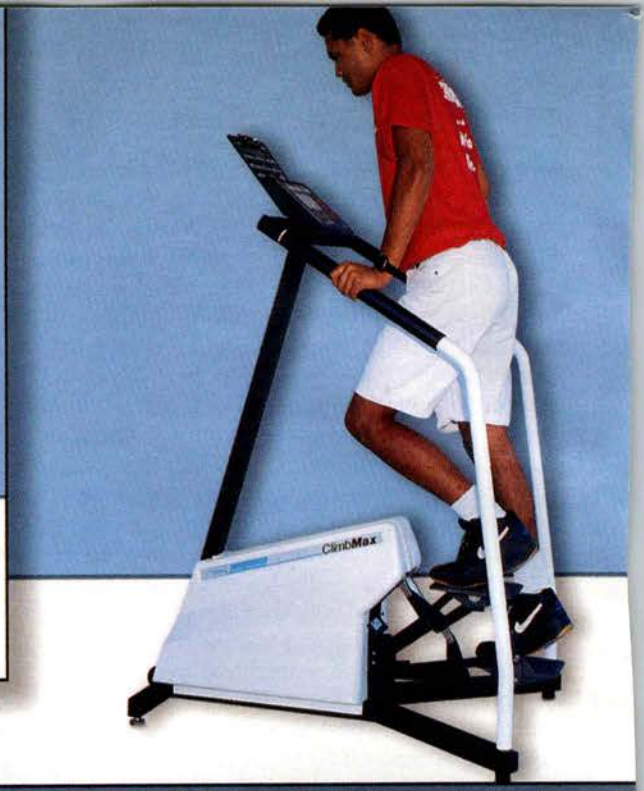
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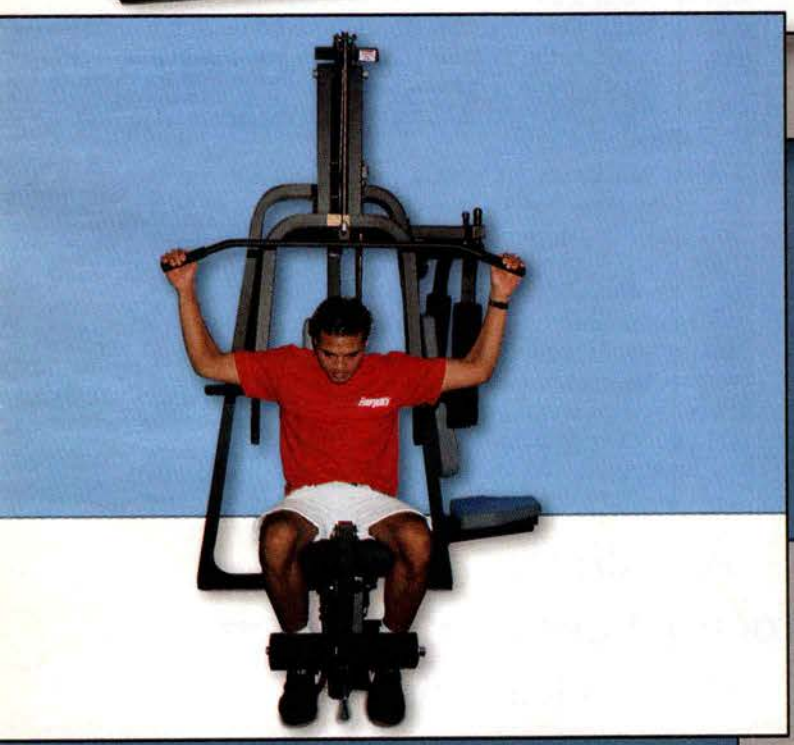

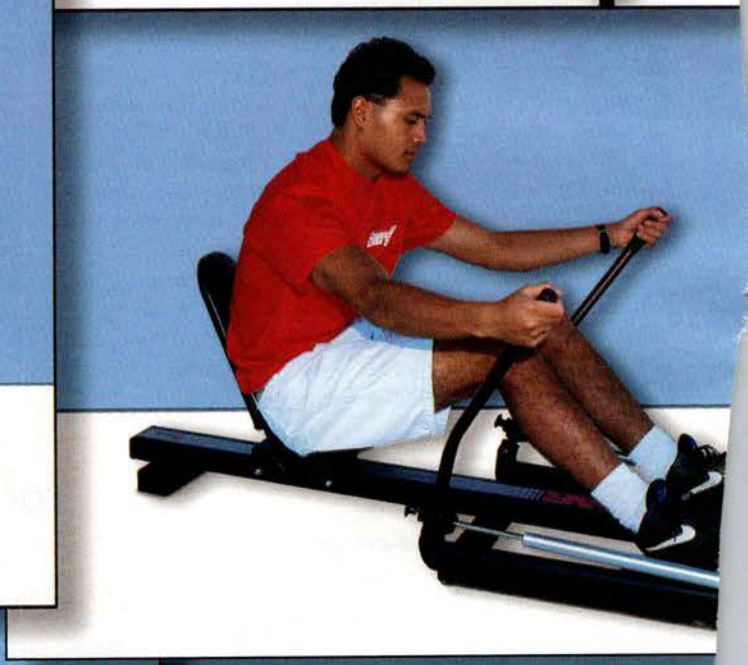

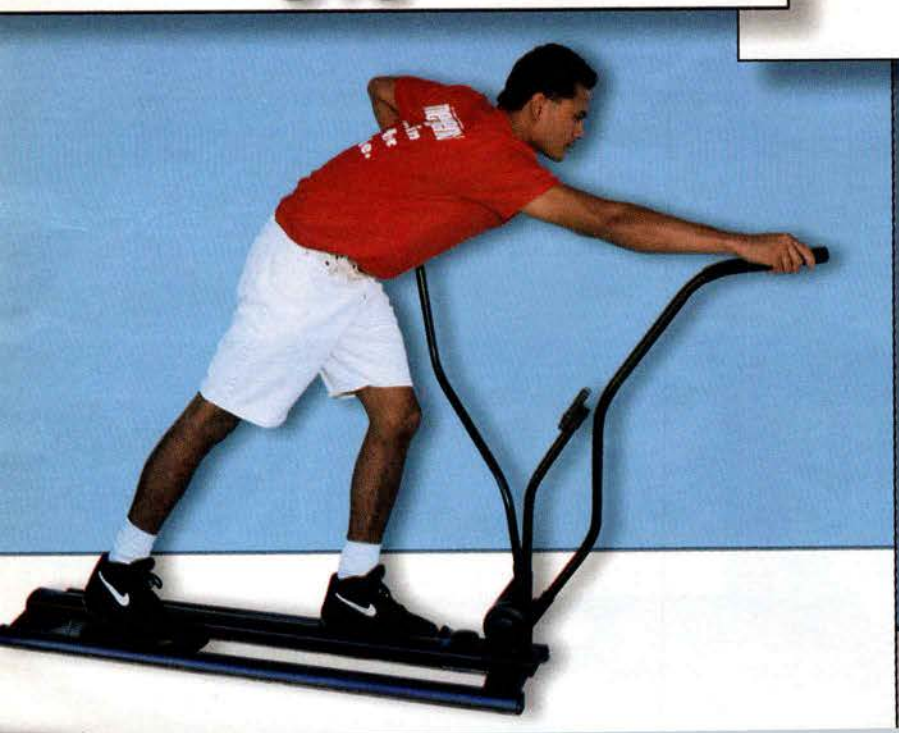

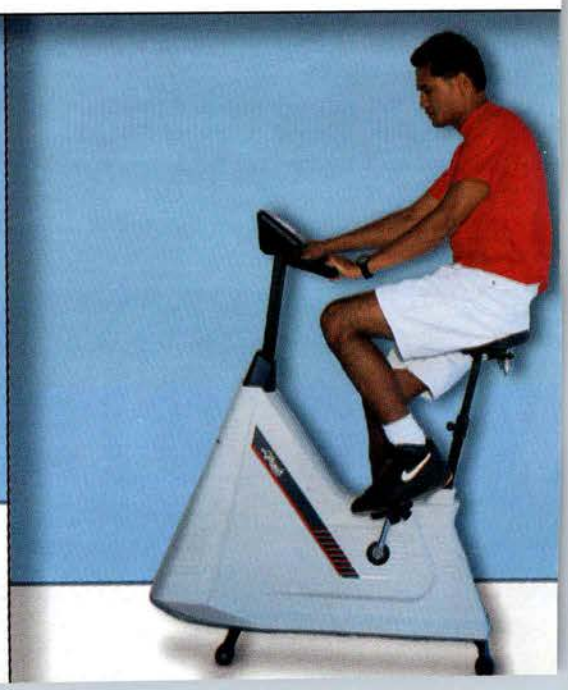

GUEST EDITORIAL

Research—it's part of the job

EMS is at the leading edge of technology. As you can see in this issue of *Emergency,* we continue to advance, to push the outer limits of the envelope, to innovate. This issue has a terrific mixture of treatments and technology that has been around for awhile (needle cricothyroidotomy), innovations from the recent past (pulse oximetry), and the newest in hot topics (computer-aided dispatch). Unfortunately, although we continue to expand the technology used in EMS, we continue to do it based on best guesses and best intentions, instead of on a solid foundation of research and science as the rest of medicine handles new advances. Most of what we do and, in particular, the activities that are EMS "truths," are based on anecdotes and assumptions instead of built on a solid foundation of research.

If we really want EMS to assume a significant role as an integral component of the health care delivery system, we need to take responsibility for the same standards for advancement of medical care as the rest of medicine. That is, new advances *must* be based on a solid foundation of research and science that demonstrates:

- direct benefit to the patient;
- minimal risk to the patient;
- effectiveness (cost and outcome).

All around us, the world in which we live and practice is changing. By the time you read this, President Clinton's proposal for comprehensive reform of the health care system will likely be near release and already the subject of intense scrutiny and debate. It is clear, however, that a reformed health care system will significantly favor medical treatment that has been *demonstrated* to be effective—both from the cost perspective and the outcome perspective. Those treatments and technologies that cannot demonstrate effectiveness will clearly be last in line when the reformed system distributes the payment.

Those who have tried to do pre-hospital research throughout the country have long identified the single biggest obstacle to effective research as the pre-hospital provider. How many times have you heard or said: "My job is to take care of patients—not fill out a bunch of paperwork"?

I am comfortable there will be a role for EMS in a reformed health care system. That role, however, may be severely limited unless we—the EMS professionals—wake up and actively participate in a comprehensive effort to perform research and validate what we do.

Our patients deserve the reassurance that comes with knowing everything we do for them has been established to be safe and effective. Furthermore, the nation deserves a pre-hospital health care delivery system that quickly and efficiently delivers beneficial and cost-effective care to those who need it. Both goals will only be achieved if you play an active role in the design and implementation of valid and pertinent pre-hospital research. The job *is* more than just taking care of patients—much, much more.

William R. Metcalf
Associate Executive Director, Policy
American College of Emergency Physicians
Executive Director, Emergency Medicine Foundation
Dallas, Texas

New Hope for Stroke Victims

The first national guidelines for the emergency treatment of stroke victims are being distributed to care providers by the National Stroke Association (NSA). Through a collaborative effort of seven medical organizations, including the National Institute of Neurological Disorders and Stroke, a consensus statement titled *Stroke: The First Six Hours—Emergency Evaluation and Treatment* has been developed. It provides vital information for the immediate treatment of stroke victims, including rapid transport and speedy diagnosis to determine cause. It urges patients or caregivers to first contact 911, then notify the primary physician. After evaluation, the hospital ED should be notified by the EMT or paramedic to arrange for equipment upon arrival. Early consultation with a neurologist and a CT scan are also recommended for diagnosis.

To be effective, however, these guidelines must be followed within the first six hours of symptom onset—and, according to a 1991 Gallup survey, many victims don't recognize the warning signs. Says Dr. Fletcher McDowell, president of NSA, "Research shows that if a stroke is treated aggressively within the first six hours following symptom onset, chances of recovery significantly improve. Stroke symptoms should be identified as a brain attack, much as chest pain signals heart attack. This is the message we are bringing to hospitals, physicians and the public."

To reach the public, NSA is launching a nationwide stroke awareness program to teach people, especially the elderly, how to lower risk and identify warning signs. According to Jim Lannon, executive director at NSA, warning signs include numbness or paralysis on one side of the body, sudden decreased or blurred vision, difficulty speaking or understanding speech and loss of balance or coordination. He also notes that several symptoms usually occur simultaneously.

For a free brochure, *Preventing Stroke in Later Years*, contact NSA at (800)STROKES. For more information about the consensus statement, contact: NSA, 8480 E. Orchard Road, Ste. 1000, Englewood, CO 80111-5015; (303)771-1700 or FAX (303)771-1886.

STEVE SMITH

NFPA Releases Position Paper on Flight Paramedics' Role

As more flight paramedics join air medical programs, the National Flight Paramedics Association (NFPA) has developed a position paper on their role in the pre-hospital environment.

The paper outlines minimum training requirements such as completion of an EMT-Paramedic course that uses DOT guidelines; successful completion and maintenance of an American Heart Association ACLS course, a PALS course and a recognized Trauma Life Support course; and successful completion of a course specifically designed for flight personnel, including air medical issues and treatment modalities. The paper also states flight paramedics should have a minimum of three years experience in the field as an EMT-Paramedic, working as an ALS provider *prior* to entering the air medical profession.

Responsibilities include taking an active role in ensuring safety for all components of rescue and health care teams, including haz mat response; performing thorough physical assessment; implementing treatment; transporting patients to the closest appropriate facility; documenting any pertinent findings and treatments administered for patients' medical records; and helping develop a quality improvement system to enhance performance.

The position paper is a representative voice of NFPA members, as it was created from responses to a questionnaire sent to the membership. For a copy, contact NFPA National Office, 35 S. Raymond Ave., Ste. 205, Pasadena, CA 91105; (818)405-9851 or FAX (818)793-1039.

FDA Gives OK

Physio-Control Corporation, which manufactures defibrillator/monitor/pacemakers, has resumed distribution of its LIFEPAK 10 model, following an FDA reinspection of the company's documentation, processes and procedures. Production of the device is expected to reach full volume during the third quarter of 1993. The company also expects to resume shipment of its LIFEPAK 9 products and LIFEPAK 300 automatic advisory defibrillators later this year.

A CUT ABOVE

New Paramedic Scissors From Graham-Field

These tough shears with razor-sharp stainless steel cutting edges can cut through leather, plastic, clothing and even light metal. Fully autoclavable, they feature contoured polypropylene handles and a safety bandage tip for added patient protection. Versatile, durable, lightweight and compact, they are ideal for all emergency care uses.

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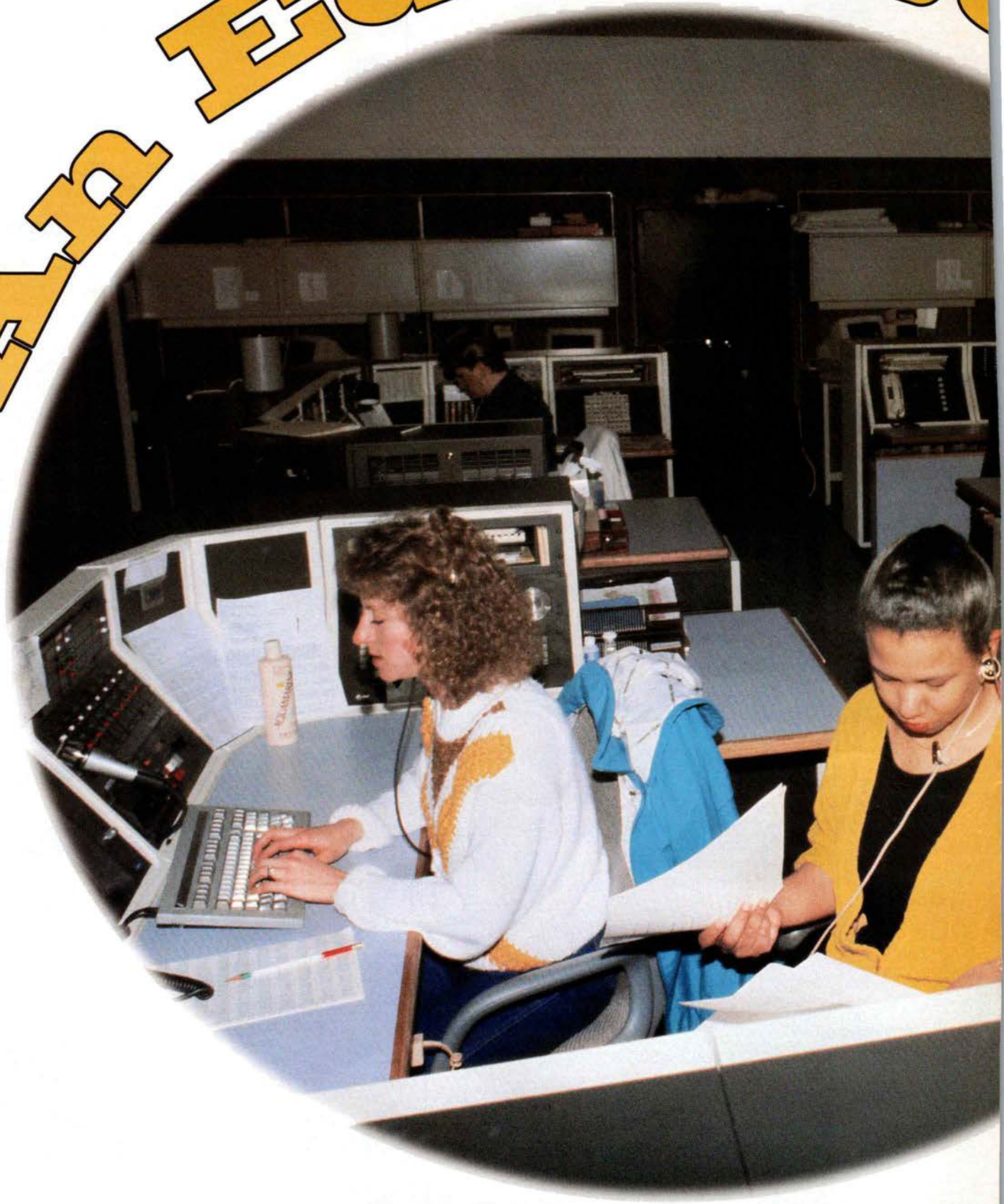
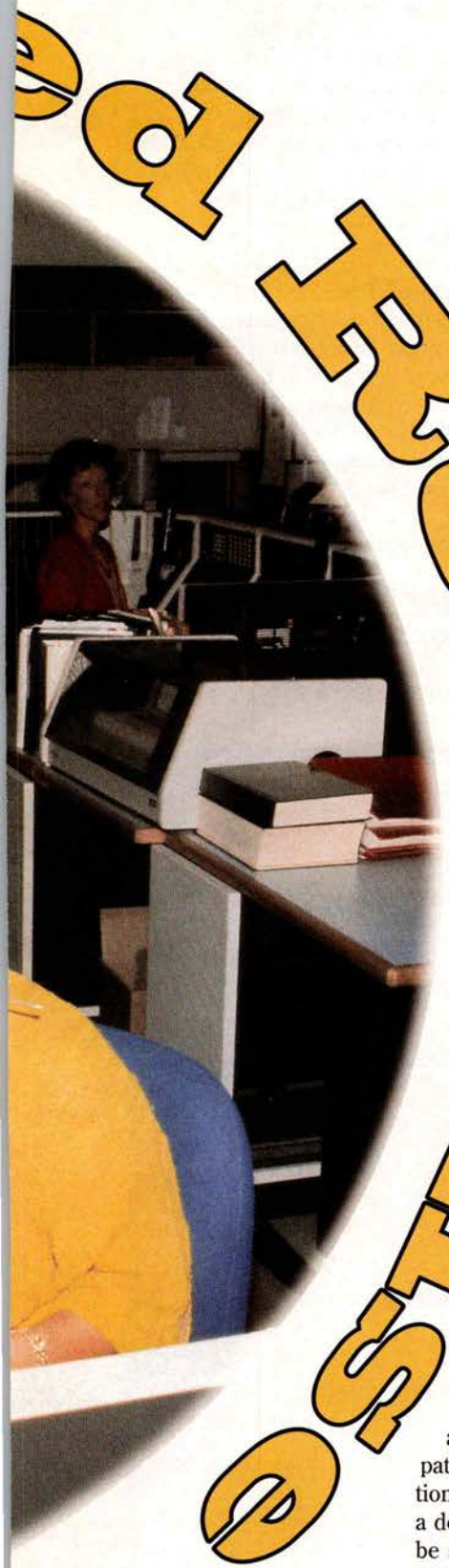


VALLEY COMMUNICATIONS CENTER.
PHOTO COURTESY OF KING COUNTY E911.

BY LINDA CULLEY, BA • MICKEY EISENBERG, MD, PHD
CHRISTY HORTON, MD • MICHAEL KOONTZ, EMT-P, MSO

Criteria Based Dispatch sends the appropriate providers to the scene



Emergency medical dispatch (EMD) is the first link in a complicated chain of emergency medical services. Any chain is only as strong as its weakest link, and regrettably, many consider EMD to be the weakest link in most EMS systems. This situation is rapidly changing, however. The National Association of EMS Physicians (NAEMSP), under the guidance of Jeff J. Clawson, MD, has adopted a position paper on EMD, which reflects a national trend toward recognizing its importance.[1] Along with the interest from the medical community is a new interest on the part of the dispatch community to strengthen its EMD programs, which often become lost between law enforcement and fire dispatch priorities. This interest in EMD has been generated by dispatchers on local, state and national levels. The American Society of Testing and Materials (ASTM) has adopted new standards for EMD and The APCO Institute (a nonprofit subsidiary of the Associated Public-Safety Communications Officers) has identified EMD as the next priority for its training program development.[2]

In King County, Wash., we have identified improving EMD as our priority for the 1990s. Through a 1989 survey of dispatchers and paramedics, two primary problems were identified. The first problem was a high level of frustration and dissatisfaction with the system among dispatchers and field personnel. It did not seem to be effective in supporting the dispatchers' ability to make decisions about which EMS units should be dispatched to an incident. Secondly, a lack of medically oriented training for the dispatchers caused inconsistencies in the allocation of EMS resources. Paramedics were frequently, and inappropriately, sent on basic life support (BLS) calls, making them unavailable for advanced life support (ALS). Having identified dispatch as the critical factor in determining the appropriate response level for an EMS call, a committee of paramedics and dispatchers, created by the King County Emergency Medical Services Division, developed and implemented a new EMD program called Criteria Based Dispatch (CBD) in 1990.

What is Criteria Based Dispatch?

Criteria Based Dispatch is based on the recognition that the level of care (ALS vs. BLS) needed by the patient and the urgency of patient care should be the determining factors in the level of response. Critical medical emergencies are those where paramedic intervention within minutes can be crucial to the patient's outcome. Noncritical emergencies are those in which paramedic intervention is not immediately needed and time is not a critical factor in treatment; therefore, a delay of several minutes would make no difference. In other words, we should not be sending a level of care the patient does not need and we should not be sending units Code Red (red lights and siren) if time is not critical to patient care.

CBD uses specific medical criteria to determine the appropriate EMS level of response. It allows critical medical conditions to receive ALS and less critical condi-

tions to receive BLS, based on the seriousness of illness or injury, as determined by the information elicited from the caller. Thus, CBD allows for an efficient use of reported information to allocate EMS resources.

How does CBD differ from a question-based EMD program?

A key assumption in the development of the CBD program is that dispatchers are intelligent professionals who, with experience, recognize that information comes to them in many different ways. The reporting party often provides detailed information in a spontaneous, random and unsolicited fashion, as well as responding to questions. For example, if a caller reports, "I need an ambulance, my husband is having chest pain and now it's much worse," the dispatcher need only determine that the patient is over 35 to immediately know what level of dispatch is appropriate, without further interrogation.

Dispatchers use an All Callers Interrogation (see **page 31**) to obtain identifying information, establish the chief complaint and determine if lifesaving emergency medical instructions are needed. After this initial interrogation is completed, there are no structured questions the dispatchers must ask. A list of Vital Points or suggested questions are provided on the condition card to help the less experienced dispatcher. None of these suggested questions, however, are required.

What are the criteria?

The criteria are specific signs, symptoms, mechanism of injury or circumstances that indicate the level of criticality of a medical or traumatic condition. Each criteria has been developed with an associated medical diagnosis or condition (see **page 32**). For example, "chest pain in an adult male over age 35" is assumed to be an MI until proven otherwise and is a criteria for an ALS response. A female less than age 40, who is experiencing chest pain but is not short of breath, nauseated or diaphoretic (ALS criteria) is a BLS Red response.

How many criteria must be found in order to dispatch a response?

Although there may be as many as nine criteria listed for an ALS response in a category, only one need be reported in order to dispatch an ALS response for that patient. As the dispatcher interrogates the caller, he or she searches for ALS criteria first, moving from top to bottom to determine the correct response. The criteria are listed in order of medical importance. If no ALS criteria are met, the dispatcher should then move to the BLS/Red and the BLS/Yellow categories.

What are Vital Points?

The Vital Points section of each chief complaint category (see **page 32**) provides key areas of interest to aid the dispatcher in the interrogation process. Suggested questions are

CARDIAC/RESPIRATORY ARREST/Adults

1. Does anyone there know **CPR**? *(Trained bystanders may still need instructions. Ask!)*
2. Get the phone **NEXT** to the person, if you can.
3. Listen carefully. I'll tell you what to do.
   - Get him/her **FLAT** on his/her back on the floor.
   - **BARE** the chest.
   - **KNEEL** by his/her side.
   - **PINCH** the nose.
   - With your **OTHER** hand, **LIFT** the **CHIN** so the head **BENDS BACK**.
   - **COMPLETELY COVER** his/her mouth with your mouth.
   - **FORCE 2** deep **BREATHS** of AIR into his/her **LUNGS** -- just like your blowing up a big balloon.

   REMEMBER:
   - **FLAT** on his/her **BACK.**
   - **BARE** the **CHEST**.
   - **PINCH THE NOSE.**
   - With your **OTHER** hand, **LIFT** the **CHIN** so the head **BENDS BACK. FORCE 2 BREATHS.**
   - **THEN, COME BACK TO THE PHONE!** If I'm not here, stay on the line.
4. Is he/she **MOVING** or **BREATHING NORMALLY**?
   (If yes): Roll the person on his/her side and check for breathing until help takes over.
   (If no): Listen carefully. I'll tell you what to do next.
   - Put the **HEEL** of your **HAND** on the **CENTER** of his/her **CHEST,** right **BETWEEN** the **NIPPLES.**
   - Put your **OTHER HAND ON TOP** of **THAT** hand.
   - **PUSH DOWN FIRMLY, ONLY** on the **HEELS** of your hands, 1-1/2 to 2 inches.
   - Do it 15 times, just like you're **PUMPING** his/her chest. *(Count: 1-2-3...)*
   - **MAKE SURE** the **HEEL** of your hand is on the **CENTER** of his/her chest, **RIGHT BETWEEN** the **NIPPLES.**
   - Pump 15 times.
   - Then, **PINCH** the **NOSE** and **LIFT** the **CHIN** so the head **BENDS BACK.**
   - **2 MORE** breaths and **PUMP** the **CHEST** 15 times.
   - **KEEP DOING IT: PUMP** the **CHEST** 15 times. Then 2 **BREATHS**.
   - **KEEP DOING IT UNTIL HELP CAN TAKE OVER.**
   - I'll stay on the line.

NOTE: IF CALLER REPORTS VOMITING, INSTRUCT CALLER TO:

- Turn his/her head to the side.
- Sweep it all out with your fingers before you start mouth-to-mouth.

provided to elicit information from the caller. Entry-level dispatchers may benefit more often from these questions and rely on them less frequently as they gain experience.

The Vital Points also include questions to gather information from the caller, which is then given as a Short Report to the responding units. These questions may not obtain information essential in making the initial dispatch decision, but provide the responding units with a more complete picture of the situation. When interrogating the caller for a diabetic patient, for instance, Short Report questions might include, "When did the patient last eat?" and "When did the patient last take medication?" This is nice-to-know information but is not essential to determine the level of response.

A Short Report should contain chief complaint, age, sex, pertinent related symptoms and any medical/surgical history, if relevant. The medical history of a patient is not always required and is *never* the sole criteria for the level of response sent. The Short Report should also provide information on other units responding and any presenting danger to the aid crew. The category Assault/Trauma, for example, includes the Short Report question: "Is the suspect/assailant still present?"—vital information for the first responding units, but not important for the dispatcher to decide on an ALS or BLS unit.

What are the levels of response?

In the King County system there are three possible levels of response provided by the CBD guidelines. The first set of criteria indicates a medical emergency that requires ALS treatment (time is critical to survival). In this case ALS and BLS units are dispatched simultaneously, responding red lights and siren. A BLS unit is always sent in addition to the ALS unit because they (BLS) will arrive at the scene on average in five minutes. The average response time for an ALS unit is 10 minutes.

The second set of criteria indicates a medical emergency that requires only BLS care; however, time is still an important factor. This is a BLS/Code Red response, and a BLS unit responds with red lights and siren.

The third set of criteria indicates a nonemergent call where time is not critical. This is a BLS/Code Yellow response, and the unit responds *without* red lights and siren at surface traffic speed.

How flexible is Criteria Based Dispatch?

The criteria under each level of response are approved by the medical director of each system that implements CBD. A specific criteria easily can be moved from an ALS level to a BLS level in your system. A jurisdiction may also change the response mode. By definition, all ALS responses should be Code Red; however, BLS units do not have to respond Code Yellow. All BLS responses may be Code Red, if desired. The legal authority and medical directors within each jurisdiction must weigh the benefits of responding Code Red against the potential liability of damage caused in an accident responding Code Red to a nonemergent call. If a call is dispatched Code Yellow and the patient deteriorates, the responding units may

All Callers - Interrogation

1. What is the problem?
2. What is the address of the patient?
3. What is the telephone number you are calling from?
4. What is your name? (*Optional*)
5. Is the person conscious (*able to talk*)?

   (*If no*): Go directly to **Question #6.**
   (*If yes*): Go directly to **Other Conditions.**

6. Is the person breathing **Normally**? If uncertain: **Go and see** if the chest rises, then come back to the phone.

   (*If no*): Go directly to **Unconscious and not breathing normally** below.
   (*If yes*): Go directly to **Unconscious and breathing normally** below.

7. I have advised the dispatcher to send help.* - **Stay on the line.** (Do not put the caller on hold, unless necessary.)

Unconscious and not breathing normally: *Dispatch* **MEDIC** *response.*

Do you want to do CPR - **I'll help you!**

(*If no*): Reassure the caller that the dispatcher has been advised* and stay on the line, if possible.
(*If yes*): Go to **Cardiac/Respiratory Arrest**, Section III. Determine appropriate age group.

Unconscious and breathing normally: *Dispatch* **BLS** *response.*

Go directly to **Unconscious/Unresponsive/Syncope**, Section II. (*Dispatch* **MEDIC** *response if needed.*)

Other Conditions:

Determine appropriate response level and **dispatch** *aid.*

I have advised the dispatcher to send help* - **Stay on the line.** (Do not put the caller on hold, unless necessary.)

* Local agency protocols for acceptable wording should be followed.

REVISED 12/9/91

Background Information

Chest Pain/Discomfort/Heart Problems

Chest pain may be caused by many conditions, some of which are critical. Although it is often difficult to determine which calls are critical, some of the following information may be helpful.

Critical causes of chest pain:

Myocardial Infarction occurs when a portion of the heart muscle dies due to lack of oxygenated blood flow to the heart muscle. Typically the pain associated with myocardial infarction is described as a tightness, crushing or squeezing in the chest. Associated symptoms that occur with myocardial infarction include:

- Shortness of breath
- Diaphoresis
- Nausea
- Vomiting
- Radiation of pain to left arm, jaw, neck, shoulder or back

Any or all of these symptoms may occur in an individual with a myocardial infarction.

Angina Pectoris is chest pain which occurs because of a lack of blood flow to heart muscle. It is distinguished from myocardial infarction by its transitory nature and is usually relieved by rest and/or Nitroglycerin (NTG).

Supraventricular Tachycardias (SVT) are a cause of rapid heart rates (RHR). The criteria for a MEDIC response is RHR's associated with chest pain or medical history of a RHR. There are many causes of rapid heart rates which are not critical incidents and require only BLS evaluation.

Non-critical causes of chest pain include chest wall pain, pneumonia, pleurisy, esophageal reflux and/or spasm, broken ribs, costochondritis and pulled muscles.

Dispatch Criteria

Chest Pain/Discomfort/Heart Problems

Medic Response	BLS Red Response	BLS Yellow Response
7M1 Unconscious/not breathing	**7R1** Male < 35 yrs w/o MEDIC criteria	**7Y1** Male < 35 yrs. or female < 40 yrs., w/chest wall trauma w/o MEDIC criteria
7M2 Male > 35 yrs	**7R2** Female < 40 yrs w/o MEDIC criteria	
7M3 Female > 40 yrs	**7R3** Rapid heart rate w/o MEDIC criteria	
7M4 With any of following symptoms, 15-35 yrs: • Short of breath • Nausea • Diaphoretic	**7R4** 3rd party report, caller not with patient	
7M5 Rapid heart rate w/ chest pain, or medical history of rapid heart rate		
7M6 Syncope		
7M7 With cocaine/crack use		

Vital Points

- Where is the pain located?
- Does the patient feel pain anywhere else in the body?
- How long has the pain been present?
- Does the pain change when the person breathes or moves?
- Is the patient short of breath or does it hurt to breathe?
- Is the patient nauseated or vomiting?
- Is the patient sweating?
- Is the patient experiencing rapid heart rate w/the chest pain?
- Does the patient have a history of rapid heart rate?
- How does the patient feel when he/she sits up?
- Is the patient taking nitroglycerin?
- Has the patient ever had heart surgery or an MI?

Pre-arrival Instructions

- Have patient sit or lie down.
- Keep patient calm.
- Does the patient have NTG? Has the patient taken one?
  If no, take as your physician has directed (patient seated).
- Gather patient meds.

Short Report

- Age
- Sex
- Chief complaint
- Dispatch criteria used to determine response
- Pertinent related symptoms
- Medical/surgical history, if relevant
- Other agencies responding

Revised: 3/5/93

be upgraded to a Code Red. It is recognized that not all EMS systems will have the same needs or the same resources and this flexibility is designed into the program.

What if my community does not have a tiered response system?

The CBD guidelines may still be used whether or not you have a tiered response system such as King County's. The first two sets of criteria are simply combined into one group of criteria, and all medical emergencies that fall into this group would receive either an ALS/Code Red response or a BLS/Code Red response. All incidents in the third set of criteria would be a BLS/Code Yellow response.

What are pre-arrival instructions?

Pre-arrival instructions include simple first aid procedures, which can be easily followed by the caller. These instructions will always be given after the initial dispatch unless there is not time due to call volume. They have a psychological benefit to the caller, as they give the person something to do while he or she is waiting for medical aid to arrive. These pre-arrival instructions should be approved by the medical directors in each community.

Emergency Medical Telephone Instructions include the lifesaving instructions for unconscious/breathing normally, cardiac/respiratory arrest (see **page 30**) choking and childbirth. These instructions have been used in King County for more than 10 years and have been demonstrated to increase survival from pre-hospital cardiac arrest in the community.[3-5]

How do guidelines differ form protocols?

Protocols generally define specific treatment, questions or action to be taken during patient care. Guidelines, however, provide direction and assist in decision making, without structuring the course of action to the point that it becomes restrictive or limiting for the dispatcher. In CBD, the guidelines are used to define appropriate levels of care in order to assist dispatchers in determining whether to send ALS or BLS units.

What training is required for dispatchers?

The basic training program for CBD requires dispatchers to attend a 24-hour course and complete a 6-hour ride-along on a medic unit. Included in this training is an overview of the rationale for CBD, general considerations for dispatchers in emergency medical dispatching, medical/legal considerations, a three-hour section on general medical background, a four-hour session on emergency medical telephone instructions, and 11 hours of training in the 25 complaint categories that comprise the CBD guidelines. This includes a brief review of the medical background, a detailed review of the response criteria, the vital points, and pre-arrival instructions pertinent to each chief complaint category. We have observed the benefits of this enhanced level of training in increased self-confidence in dispatchers and more credibility with field personnel within our system. These dispatchers are also capable of dispatching other emergency units such as firefighters and police.

How can the system be evaluated?

The CBD system is monitored at three levels. First, an in-house evaluation form is available for individual dispatchers, peer evaluation and supervisor evaluation. Second, all dispatchers, EMTs and paramedics within the EMS system are encouraged to use a suggestions/comments/attaboys form to provide feedback to communication centers and to the King County EMS Division. Specific problem areas may be reviewed and changes in the guidelines made if necessary. Third, each dispatch criteria is given a code, called an Initial Dispatch Code (IDC). This IDC is included on all 911 Medical Incident Report forms, and allows us to compare the criteria for which the call was dispatched with the actual disposition of the patient. In this way we can examine the effectiveness of individual criteria and differences, which may exist among various paramedic or dispatch agencies.

Does it Work?

Criteria Based Dispatching has been in place in most dispatch centers in King County for more than two years. Paramedics, EMTs and dispatchers who have used CBD believe the system to be rational and effective. We now have a strong first link in the chain of EMS. The Emergency Medical Telephone Instructions, including lifesaving instructions in CPR, have been used in King County for more than 10 years. The benefits to the EMS system as a result of this part of the CBD program have been well documented in the medical literature.[3-6]

We have collected data on the use of the CBD guidelines since implementation of the program. This scientific data is currently under intensive review to determine whether the CBD guidelines have improved the efficiency of the EMS system in King County. The preliminary findings show a decrease in the frequency of requests by BLS units at the scene for the dispatch of ALS units. The results have also demonstrated a decrease in the frequency of dispatch of ALS units for two specific medical conditions, which no longer require an ALS response using the CBD guidelines. These results are encouraging and it is our goal to contribute to the next frontier in scientific research on emergency medical dispatching.

Dr. Christy Horton is the medical program director for King County, Wash., and medical advisor to the King County Emergency Medical Services Division, Seattle-King County Department of Public Health. She also practices emergency medicine at Overlake Hospital Medical Center in Bellevue, Wash.

Dr. Mickey Eisenberg is a professor of medicine at the University of Washington and co-director of the Center for Evaluation of Emergency Medical Services. He developed and implemented the Emergency Medical Telephone Instructions for dispatchers in King County in 1982.

Michael Koontz is a paramedic and medical services officer at Shoreline Fire Department in King County, Wash. He is also a member of the King County Dispatch Review Committee and an EMD instructor for the King County EMS Division.

Linda Culley is the EMD program coordinator for King County Emergency Medical Services Division and instructor of Emergency Medical Telephone Instructions for dispatchers. As chairman of the King County Dispatch Review Committee, she directed the development and implementation of the Criteria Based Dispatch program.

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BY BOB HAMM

CRYSTAL CLEAR COMMUN

High tech equipment that's all the talk among communications experts

Of all the improvements in pre-hospital emergency medical care, one of the most important has been the remarkable advances in communications. With the dispatch center as the heart of most operations, important technological advances began occurring in the early 1970s. By the 1980s, two-way radio communications had taken giant strides. Not only was voice contact with ambulances effective and instantaneous, but progressive companies had installed radio facilities in EDs. This allowed hospital medical personnel to become aware of the nature of the incoming case and provided essential information about the patient.

Throughout the 1980s, the communications revolution brought computer-aided dispatch, satellite-enhanced communications and ECG transmissions from the scene. When EMS took to the air, aeromedical helicopters adopted technology such as the Wolfsberg Flexcom Radio, able to communicate with base stations, ground ambulances, other emergency agencies and virtually anyone else with a two-way radio system. On today's fixed-wing medical flights, high-altitude flight phones provide direct contact with anyone in the world.

After all these advances, can there be any new developments in EMS communications in the 1990s? Industry leaders say there will not only be advances, but this decade may see the most dramatic ones yet. Now less than three years into the decade, we are seeing exciting innovations in the field.

Using all the latest advances, communications procedures on an emergency call today might go like this: When the call comes in, the dispatcher looks at a display terminal, where a map shows the location of the incident and available ambulances, and makes the assignment based on proximity to the scene. Call information is transmitted to an onboard mobile data terminal and simultaneously to pagers carried by the medics, in case they are out of the ambulance. The map showing the location of the ambulance and the incident comes up on the screen in the vehicle. The medics, if they have questions, talk back to dispatch by data terminal, two-way radio, or cellular phone. If there is any difficulty in finding the location, they pick up the cellular phone and talk directly to someone at the scene, eliminating the relay of information through the dispatcher.

At the scene, medics quickly record patient information, which is instantly translated from their handwriting to com-

PHOTOS COURTESY OF ACADIAN AMBULANCE AND AIR MED SERVICES

No matter how hard you work, how impossible the conditions, people are going to question your decisions.

What to do if you become

SUBJECT to INVESTIGATION

BY KATY BENSON

At 2 a.m., you are at the scene of a two-car accident with serious injuries. Frantic victims and appalled onlookers are standing in the rain, moaning or crying or asking questions. "It's a setup for a mistake to happen," says David Bailey, RN, quality assurance specialist for San Diego County Division of EMS.

Despite all your training and experience, something might go wrong. Or nothing might go wrong, as far as you're concerned, but a patient or even a peer sees it differently. Next thing you know, someone from the state EMS authority is asking questions. Can you recall what happened that night? What treatment did you give, and why? Who authorized it? Who witnessed it? He's looking at records and calling on your colleagues, too. What is this, you wonder, a court of law with you as the defendant?

No, but it *is* an investigation that could result in a charge of non-compliance with EMS regulations and disciplinary action against you. If the complaint proves to have substance, you might be scolded, suspended until you complete a refresher course, or even have your license revoked. What can you do?

Although statutes governing pre-hospital practice, complaint investigations and punitive actions vary from state to state, some general guidelines can apply.

The Making of a Complaint

State laws define the realm of authority for EMS providers at every level. The intent, of course, is to protect the public. A complaint against you can range from a threat to the public (drinking on the job or exceeding your scope of practice) to annoying the public (keep those blonde jokes to yourself).

Complaints come from patients, their families, fellow EMTs and paramedics, ex-spouses, doctors, nurses and competing providers. In southern Texas, one ambulance owner asked the state Bureau of Emergency Management to help him decertify one of his own ambulance teams, which was running illegal drugs.

In general, complaints from the public are "well-intentioned but not informed," says Bob W. Bailey, chief of EMS for North Carolina. In his experience, complaints from peers and "providers with an axe to grind" reap more serious findings than those from the public.

A sampling of state EMS offices, as well as the National Registry of Emergency Medical Technicians (NREMT), indicates that statutes guarantee due process for pre-hospital workers subject to investigation or discipline. The EMT or paramedic is informed of the complaint, the investigation, the findings, and any disciplinary action to be taken. He or she is offered opportunities to provide explanations, proof, witnesses or other support, and to appeal decisions.

State policies differ, however, and pre-hospital providers who are being investigated should learn the specifics of their local regulations. For example, NREMT requires all complaints be in writing and signed; anonymous ones go in the wastebasket. But in Texas, "any complaint—written, oral, named or anonymous—*must* be investigated," says C. Wayne Morris, EMS program administrator for Public Health Region 4.

Florida requires complaints to be in writing and signed, says Ed Wilson, enforcement section supervisor of the state EMS office. But occasionally he will follow up unofficially on an anonymous tip "to see if it's valid."

North Carolina prefers to have complaints in writing, and will ask phone callers or unnamed sources to do so. Otherwise, if the case comes to a hearing, "their memory may change," Chief Bailey says. If they agree to a signed complaint, however, "it's a good indication [the complaint] is valid."

Innocent Until Proven Guilty

However complaints are received, they remain only allegations until an investigation shows a violation actually happened. "A complaint does not mean you're guilty," says Morris, and neither does an investigation. In an article written for *Texas EMS Magazine* (August 1992), he explains that investigators "are fulfilling only one task, the gathering of information. They will not be the judge of what they find and they will not be the jury."

A reminder is in order, at this point, that the investigation is not a criminal one and findings against you are not legal charges. The goal is not so much to serve justice as to serve public safety.

"Formal rules of evidence shall not apply," reads NREMT's Policy and Procedures Manual. "All information related to the allegations shall be admissible at the hearing, whether or not such information would be admissible in a court of law." The purpose, it continues, is to get *all* pertinent data.

Cooperation is your best strategy should you find yourself in the midst of an investigation. The allegation may not be substantiated, and even if it is, your honesty can tip the scales in your favor.

try can help monitor potential respiratory depressant effects.[15,30,38,40-42]

Circulation

Although peripheral vasoconstriction may prevent the pulse oximeter from detecting a pulse, this in itself may be useful because it will alert the provider to the possibility of impending cardiovascular collapse. This is also an instance where oximeters with plethysmographic waveforms may be desirable, since a change in the amplitude of the waveform is said to be an indicator of circulatory changes.

Mentioned earlier is the ability of oximeters with waveforms to obtain a systolic blood pressure. This is done by applying the oximetry sensor and blood pressure cuff, with a sphygmometer, to the extremity. The blood pressure cuff is then inflated slowly while monitoring the signal strength and waveform of the oximeter; the point at which the pulse signal is lost is the systolic blood pressure.[43,44]

Oximeters may aid in the evaluation of the seriousness of an orthopedic injury and its relationship to vascular compromise. They can also be functional in assessing the adequacy of circulation distal to a fracture before and after splinting, especially when traction splints, inflatable splints or a PASG is being applied. Additional study in this area is warranted.[15]

CONCLUSION

Though never intended to be a replacement for a complete primary and secondary survey or physical exam, there are several ways oximetry can be a useful adjunct. EMS providers who are faced with many patients or multiple concerns with respect to a single patient, may find SaO_2 data can help them determine their priorities of care. Their value is unmatched as far as providing warning of an imminent deterioration in a patient's status. Changes in SaO_2 often occur before other more easily detectable changes occur, such as heart rate, blood pressure or skin sign changes.

Oximetry may become one of the most significant contributions to the prehospital "arsenal." It can help rationalize the actions and/or interventions made in patient care. If one understands the principles, indications and limitations of pulse oximetry, and remembers the cliche "treat the patient, not the machine," there is no justifiable way oximetry can mislead its user. There is probably no other measure of total patient status that can be represented so clearly and concisely. E

Dana Cox is the transport education coordinator at California Shock/Trauma Air Rescue (CALSTAR) in Hayward, Calif.; an instructor at Santa Cruz County Emergency Services Training Center, paramedic program; and per diem staff nurse in Dominican Santa Cruz Hospital's ED. She is also a member of Emergency's *advisory board.*

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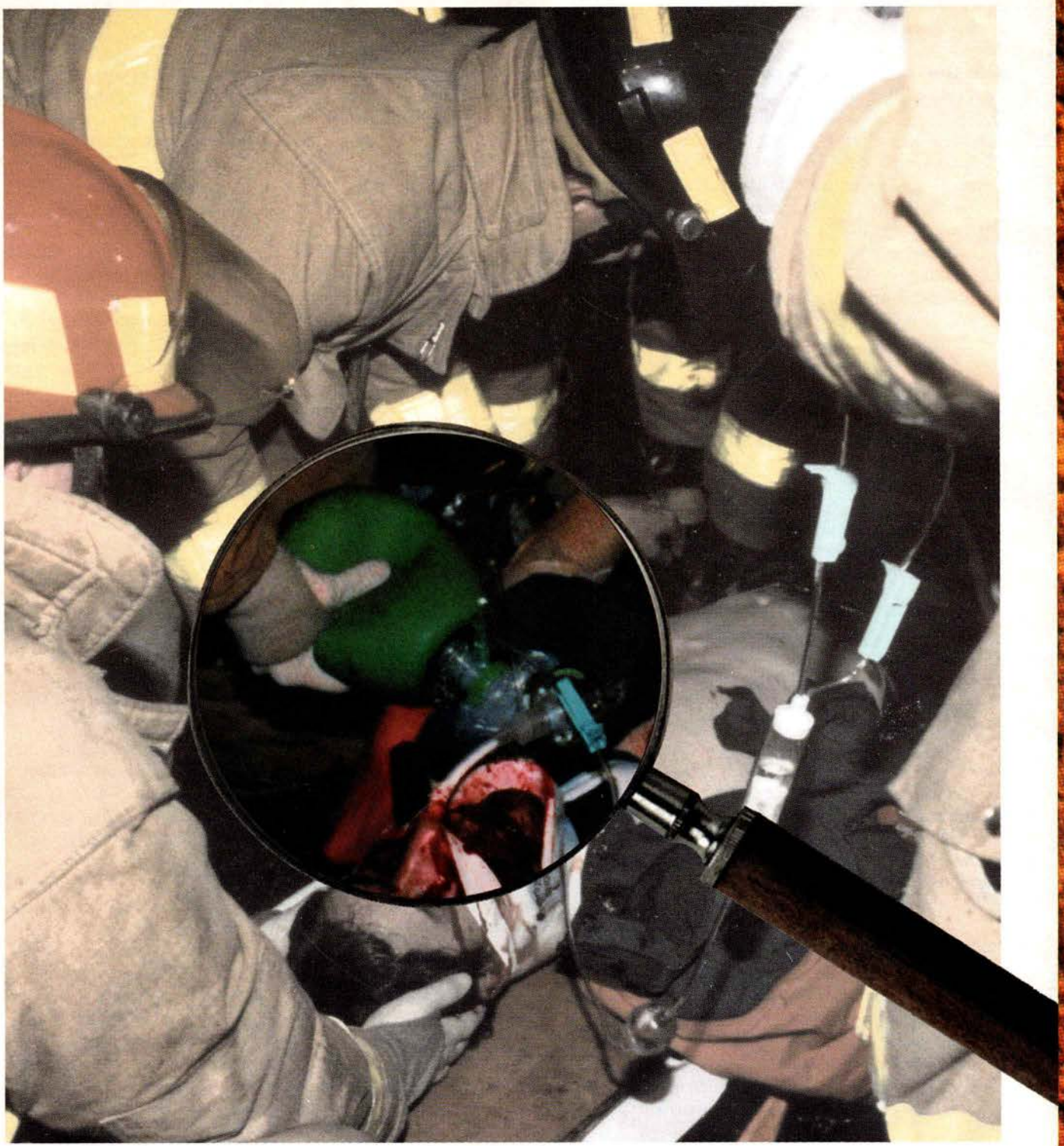


THOMAS E. COOPER

Just the Facts, Ma'am

"What we look for is straightforwardness in resolving the problem," says Bailey of North Carolina. "If the person is defensive or belligerent, the flags go up. Invariably, if there's that much resistance, that person is trying to hide something."

He illustrates with a situation of an EMT performing a paramedic procedure that could potentially hurt the patient. "That's very serious to us," he says, but more damning would be an attempt to cover up the incident. It suggests the act was intentional, "and we're more apt to get the person off the street permanently. But if he's honest and admits the mistake, he's more apt to get his license suspended rather than revoked."

Wilson, too, advises telling the truth, even about errors. "Stick to the facts, don't give opinions, don't attack the individual who complained. But if you feel it's a grudge or personal disagreement, say so." People wanting guidance in how to respond to allegations or how to express themselves in a hearing can call his office for help, he adds. The purpose is to solve a problem, if

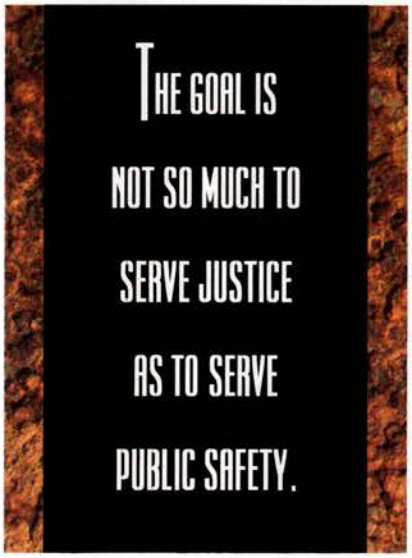
indeed there is one, not to find a scapegoat.

San Diego County Division of EMS, one of 30 agencies operating independently under an umbrella of state regulations, addresses complaints not as an individual's problem but as a "systems quality improvement issue," according to David Bailey. Solutions tend to be educational rather than punitive. But first a person must be educable, and that means being able to admit to error or the need for improvement.

San Diego County EMS deals separately with the error and the outcome. "We recognize people make mistakes," Bailey says. Even a serious mistake, one resulting in a patient's death, for example, is still an error to be treated educationally. "If it gets into the press, it can be difficult, but we try not to let a bad outcome get in the way of how we treat it. That might be different from how lawyers treat it.

"[A mistake] doesn't mean the person can never be a paramedic again. It means he or she needs more education to ensure public safety."

Vic Dwyer, chief investigator for Texas EMS, would disagree. A "blatant error in care," even if admitted, will earn punitive action in the Lone Star state, he says. "If you don't do the basics, that fact that it was a mistake won't make a difference. We still get lawsuits for mistakes."



Local Yokes

State EMS authorities may give local agencies some say in handling complaints, identifying problems and meting out discipline. Even Texas' tough line accommodates a local medical director's suggestions for whether to suspend an erring EMT or put him or her on probation pending completion of a remedial training course. "If we're confident the medical director is taking the appropriate action, we're likely to buy off on it," Morris says. "Our motive is to get the local people involved in policing themselves. We'd like to be the last resort."

In 1992, Dwyer handled an estimated 295 investigations for the state, taking action on 70 percent of them. In contrast, Florida investigated 98 complaints in fiscal year 1991-1992, finding violations in approximately 30 of them.

Bob Bailey estimates that 35 or 40 of North Carolina's cases turned into full investigations in 1992. Lesser charges often result in a wrist slapping, such as a letter of reprimand. Many unintentional errors are caught through the local audit and review process, and agency medical directors are empowered to assign an EMT to remedial training or temporarily suspend certification.

San Diego County EMS has a built-in system of intervention, which may account for less than one complaint a year turning into a full investigation, according to David Bailey. Each base hospital (San Diego has eight) has a medical director, ED nurse and nurse coordinator whose "job is to monitor [pre-hospital calls] and intervene educationally," Bailey says. The team reviews run sheets, tapes and patient records daily to catch possible errors or problems.

But the trade-off is intense, if less threatening, intro-agency scrutiny. "Anyone who is in the field for awhile gets investigated at some point," says firefighter-paramedic Kevin Crawford, with the Carlsbad Fire Department. "They're looking at you under a microscope."

Debbie G. Murphy, base-hospital nurse coordinator at Tri-City Medical Center for Carlsbad and two other cities, says most problems get solved in her office. Complaints come in the form of requests for review, such as from a nurse who understood a situation differently than the responding medic did. Certain problems, such as policy violations or errors in medication, treatment or protocol, must be reported to the county.

Besides reviewing the cases, the county collates these incidents by category in order to track trends. A pre-hospital audit committee (PAC) composed of base hospital directors and nurse coordinators, pre-hospital training program directors, a public- and a private-agency paramedic, an EMT, a Life Flight representative, a first-response representative and the county staff reviews them monthly. In keeping with its policy of treating problems educationally, it looks for areas where mistakes often occur, or the same type of error is made. Detecting a pattern could result in a change in training or a change in policy.

Jury By Peers

Some agencies have formed peer-review panels as an equitable way to handle complaints internally. Three years ago, for instance, Tri-City formed a base-hospital version of the county PAC, called TPAC, represented by paramedics from the three fire departments, the assistant base-hospital coordinator and an MICN.

In another form of peer review, or perhaps peer revile, Florida and Texas follow a policy of publishing the names of people who have been disciplined. The entry includes the charge and discipline taken.

Alana S. Mallard, editor of *Texas EMS Magazine*, researched precedents, as well as legal implications, before deciding to publish names and misdeeds. An EMT or paramedic whose certification is denied or revoked will see his name in print to three consecutive issues; those on suspension or probation will have their names published until the end of their term.

"It's a great deterrent," Mallard explains. "It's educational, too. It lets them know what can cause them to lose certification." Morris of Texas' Region 4 adds that the policy serves to inform pre-hospital providers that the new laws are now being enforced.

Florida prints the disciplinary actions and many, but not all, of the offenders' names as a way of "getting people's attention," Wilson says. "It makes them understand they have to follow the rules." It also generates a flurry of phone calls; notice of an action taken against a paramedic who failed to follow correct cardiac protocol spurs other medics to find out what current cardiac protocol is.

Name-publishing, though harsh, fits into the big picture painted by state EMS offices. Complaints, investigations and even disciplinary actions are not intended to punish wrong, but to maintain competent patient care, even at 2 a.m. on a rainy morning. F

Katy Benson is a free-lance writer based in San Diego, and a regular contributor to Emergency.

Granting Better CARE

A FEDERAL RENAISSANCE IN TRAUMA CARE SYSTEMS

BY
DOUGLAS M. WOLFBERG; DIANE MCMENAMIN; MIRTHA R BEADLE, MPA;
CHRISTOPH R. KAUFMANN, MD, MPH; AND JUDITH B. BRASLOW

Imagine one-half of the residents of Atlantic City, N.J., dying in one year. Consider the impact of one out of every four residents of Washington, D.C., being killed every year.

While these macabre thoughts may seem remote, trauma kills or seriously injures that many people annually in the United States. Every day, more than 380 people die from trauma, and more than 5,000 are injured severely enough to require hospitalization. This death and injury toll continues to accumulate constantly. Trauma kills more than 140,000 Americans every year and causes more than 2 million to be hospitalized. One out of every four Americans sustains some type of nonfatal injury every year.[1]

In recognition of the devastating impact of trauma, the United States Congress passed legislation in 1990 to foster the development of organized systems of trauma care. While many of the components necessary to deliver effective trauma care are present in various pockets of the country, trauma care system development has not progressed adequately in the last 25 years.[1,2] While ambulances, hospitals and providers exist throughout the country, Congress saw the need to weave these components into effective systems of care, thus giving the severely injured patient the best chance for survival.

Trauma has existed since the dawn of society. It wasn't until the mid-1960s, however, that the public eye focused on the magnitude of this epidemic called trauma (see **Figure 1**, page 28). In 1966, the National Academy of Sciences released a report titled "Accidental Death and Disability: The Neglected Disease of Modern Society."[3] This report spurred congressional action and resulted in the passage of the first federal legislation to develop EMS systems in the United States. In this initial flurry of activity, more than $308 million was allocated by the federal government between 1974 and 1981 for developing regional EMS systems.[2] Federal involvement in EMS and trauma diminished in the 1980s, as states assumed the central roles in guiding the implementation of EMS and trauma care systems.

In 1985, the National Research Council issued a follow-up report to the 1966 National Academy of Sciences publication. This report, titled "Injury in America: A Continuing Public Health Problem," found state leadership in trauma and EMS care did not produce an adequate level of system development.[1] The 1985 report led to a General Accounting Office (GAO) investigation launched by U.S. Senators Alan Cranston and Edward Kennedy, who authored the original 1973 EMS systems law. The GAO reported in 1986 that trauma care system development stalled in the absence of federal guidance, which was so important in the early 1970s.[4]

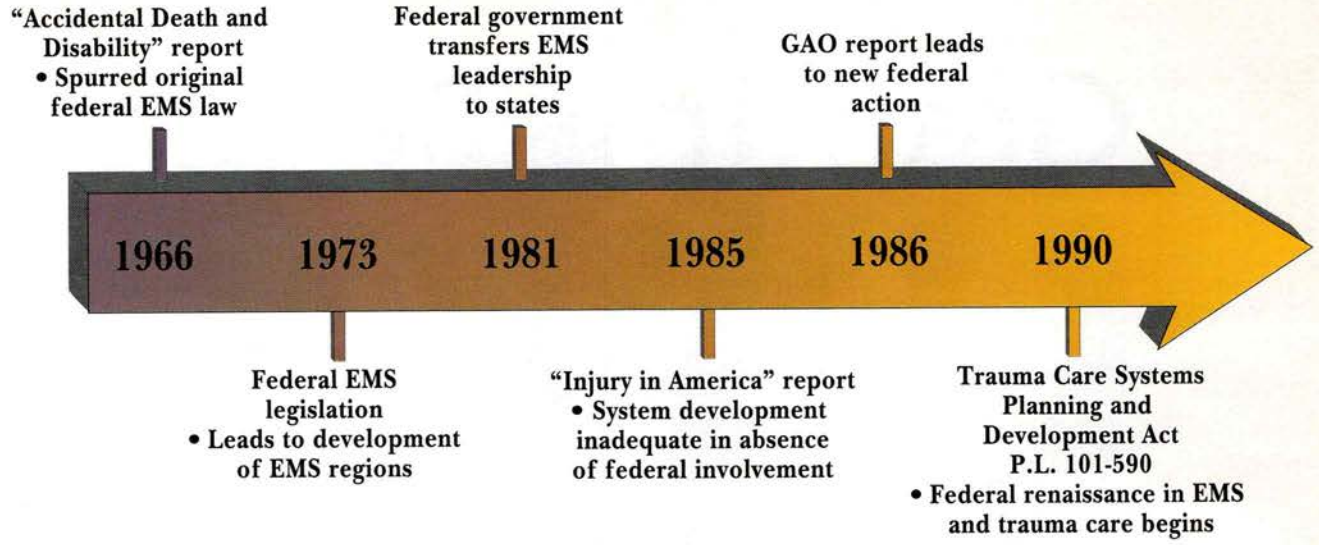
The landmark Trauma Care Systems Planning and Development Act, signed into law on Nov. 16, 1990, represented a new era of federal activity in trauma and EMS systems. In many ways, the passage of this law can be viewed as a renaissance. The federal role as a catalyst for positive change in the care of America's injured had come full circle in a 20-year span.

Step in the Right Direction

The Trauma Care Systems Planning and Development Act, Public Law 101-590, added Title XII to the Public Health Service Act. Title XII promotes the establishment of organized systems of trauma care. The law authorized a program of

FIGURE 1

THE FEDERAL TRAUMA CARE TIME LINE



grants to states for the development and implementation of trauma care systems, and grants to improve rural EMS and trauma care services. Title XII was subsequently amended to include a grant program for trauma care centers for uncompensated trauma services associated with drug-related violence, and a residency program for emergency medicine.

The authority to implement Title XII was delegated to an agency within the U.S. Public Health Service (PHS) called the Health Resources and Services Administration (HRSA). The mission of HRSA involves training health care providers, providing care for traditionally underserved populations and coordinating resources as well as developing the infrastructure for systems of care. The Division of Trauma and Emergency Medical Systems (DTEMS) was formed within HRSA in July 1992, and charged with the responsibility of implementing Title XII. Since its formation, DTEMS has recruited a staff of clinical and prehospital systems professionals and is providing technical assistance to states and local areas on issues such as trauma care planning, data, needs assessment tools, protocol development and quality assurance.

State Trauma Care Grants

One major role of DTEMS is to administer the state grant program. These grants are central to the philosophy expressed in Title XII of the need for organized systems of trauma care, and are the heart of the federal trauma care renaissance.

Title XII authorizes grants to state EMS agencies for trauma care system planning, which involves:

- developing standards and requirements for the initial designation and continued evaluation of designated trauma centers and regional trauma care systems;
- developing standards and requirements for medically directed triage, transport and transfer of trauma patients, including children;
- establishing and collecting data in a central data reporting and analysis system;
- providing public education on injury prevention and access to trauma care;
- coordinating activities between states.

In fiscal year 1992, 23 states received grant awards totaling $3,915,200 (see page 31 for list of grantees) to perform various activities related to establishing a trauma care *system*, as outlined in **Table 1**. As expected, the state grant program is fostering varied approaches to the development of trauma care systems.

In Michigan, for example, a non-regulatory coalition with members from professional associations and health care facilities has been used to stimulate the development of a trauma system. The coalition is using consensus development to provide the framework for trauma system activities, in concert with the state EMS office. In several states such as Texas and Florida, the authority for trauma system development has been delegated to a regional or area-wide agency, so the plan can be tailored to meet the unique requirements of each region.

The state grant program has also provided support for existing local trauma care systems wishing to extend care across a state. In many states, the formation of trauma care networks has taken place primarily in urban areas. Under this grant program, several states are developing a comprehensive network of trauma care facilities for all areas, especially in the suburban, rural and frontier communities, which may have been overlooked in the past.

In many cases, each rural trauma care facility establishes a reciprocal relationship with a tertiary care trauma facility in order to expedite the transfer of patients between facilities. These large urban trauma centers may also undertake outreach and staff development activities to bolster the capabilities of their smaller, rural counterparts. In some areas of the country, the unique needs of special populations, such as Native Americans and youths involved in violence, are the focus of trauma system development. These types of federally supported efforts are beginning to weave the fabric of organized state trauma care systems.

Rural Trauma Grants

Title XII also emphasizes the integration of rural areas into coordinated state trauma care systems. The law stipulates that 10 percent of the funding appropriated by Congress for Title XII is to be used for grants to improve the availability and quality of EMS and trauma care in rural areas. The legislation outlines five areas for research and demonstration projects to achieve that goal:

- developing innovative uses of new and current communications technologies;
- developing curricula and training EMS personnel in transport,

TABLE 1

STATE ACTIVITIES SUPPORTED BY TRAUMA GRANTS

ACTIVITIES	AK	FL	HI	IL	IA	ME	MA	MI	MN	MO	MT	NH	NM	NY	ND	OR	RI	SC	TX	VT	VA	WA	WV
Developing state trauma care system plan; modifying/enhancing existing plans; planning/developing regional systems within the state		•				•	•	•	•	•	•	•	•		•		•	•	•	•	•		
Establishing a state trauma advisory committee						•						•	•		•			•					
Drafting legislation to establish authority for trauma system development/oversight	•					•						•	•		•			•					
Designating/redesignating trauma centers			•	•							•			•				•				•	•
Conducting needs assessment of current trauma activities							•	•	•		•	•					•						
Developing or modifying trauma standards or protocols related to triage/treatment/transport		•	•			•			•	•		•	•	•	•	•		•		•	•		•
Creating and implementing public information/education and prevention programs	•		•										•	•					•			•	
Assisting professional education for trauma care providers in rural areas of the state	•					•						•	•			•							•
Conducting research to evaluate patient care	•			•						•						•					•		
Planning, creating or modifying a data collection system for trauma care			•		•	•		•	•	•			•		•			•		•	•		•

resuscitation and EMS system management;

- making training for original certification and continuing education more accessible;
- developing protocols and agreements to increase access to pre-hospital care and improve patient transport;
- evaluating the effectiveness of protocols regarding EMS.

In fiscal year 1992, five grants totaling $489,400 were awarded for improving trauma care in rural areas. The project at Children's Hospital in Columbus, Ohio, is implementing innovative educational and clinical approaches to enhance the knowledge and skill of pre-hospital and ED personnel in caring for injured children in rural areas. This project will involve the use of interactive training methods and a pediatric trauma care curriculum to reach this objective. Rural providers will get the chance to do clinical rotations in a pediatric specialty hospital to increase their knowledge of pediatric trauma care.

In another rural grant project, a study will review trauma deaths in Montana to determine whether any of those fatalities could have been prevented through closer compliance with established trauma care protocols. This preventable death study will also produce a manual with guidelines for conducting similar research in other rural areas.

A third rural grant project involves the implementation of a trauma training program in rural areas of Oregon to demonstrate that such training is effective in reducing response times.

The Title XII rural program is also funding two projects where studies will assess the impact of trauma patient triage and transfer protocols in rural areas of Oklahoma and North Carolina. These projects are intended to demonstrate ways of getting injured patients to the appropriate facility in the shortest possible time.

Model Trauma Care System Plan

Title XII required the development of a Model Trauma Care System Plan (MTCSP) to guide the implementation of organized state trauma care systems. The plan promotes a uniform framework for use by each state and is intended to be used primarily as a template, allowing states or local areas to tailor it to their needs. This plan identifies the essential components of a system designed to meet the needs of *all* injured patients who require care in an acute care facility (see **Table 2**).

The model plan, which can be thought of as the blueprint for the new federal trauma care initiative, is intended for states to use in the development of a comprehensive trauma care system component within the context of the broader statewide EMS plan. Thus, the plan incorporates the principle that a trauma care system must be integrated into the overall EMS system.

A second key concept is that a trauma care system plan must contain provisions for special patient categories such as spinal cord injuries, burns or pediatrics.

Finally, the MTCSP supports trauma care systems that are inclusive in nature, incorporating every health care provider or facility with resources to care for injured patients. Most of the existing regional trauma systems are "exclusive" in nature; they are driven by the major (severely injured) trauma patient who requires immediate treatment at a designated trauma center. An *inclusive* trauma system recognizes the importance of other acute care facilities within a trauma system in caring for less severely injured patients. The goal of an inclusive trauma system is to match each facility's (or provider's) resources to the needs of injured patients. In this manner, every patient would receive optimal care and every facility and provider would have a role to play in trauma care delivery.

TABLE 2
MANDATORY COMPONENTS OF A TRAUMA CARE SYSTEM

ADMINISTRATIVE
- Leadership
- System development
- Legislation
- Finance

OPERATIONAL
- Public information/prevention
- Human resources
- Communications
- Medical direction
- Triage
- Transport
- Definitive care facilities
- Interfacility transfer
- Rehabilitation
- Evaluation

Special Initiatives

DTEMS is also fulfilling its mandate by engaging in special projects contributing to the development of organized trauma care systems. One such area is data collection. Title XII makes it clear that data and information are vital to planning efficient systems of trauma care. The legislation requires states to collect, analyze and report data in a manner consistent with Title XII. Accordingly, DTEMS has assembled a national work group of experts to develop a trauma care data set with standard definitions. This initiative will build on efforts spearheaded by other federal agencies and national trauma care organizations.

Since EMS system access is vital to coordinated trauma care delivery, DTEMS is also considering efforts to improve 911 emergency telephone coverage in the United States, in conjunction with other federal agencies and national 911 organizations. In a 1986 GAO report, lack of universal 911 coverage was cited as a major impediment to effective EMS and trauma systems.

Other DTEMS special initiatives include evaluating youth violence prevention programs, working with national groups to improve EMS training and education, and analyzing major proposals for health care reform to assess their potential impact on trauma and EMS.

Getting Involved

Provider participation is vital in the trauma care planning process, and DTEMS has encouraged all of its state grantees to put this concept into practice as they develop and improve their systems. Grantee states use advisory councils to assist in developing, modifying or implementing their trauma plans, and opportunities exist for local EMS and trauma care providers to become involved with their state councils. Although membership on most councils is limited, many use committees and solicit membership from the ranks of EMS providers statewide. States involved in modifying or developing a trauma care plan are required by Title XII to hold public hearings at locations throughout the state to give individuals the opportunity to comment on the plan prior to adoption.

Beyond that, many states participating in the federal trauma care program are conducting projects relating to the training of EMS and trauma care providers. Some states are producing new or revised trauma triage or transfer protocols, which require effective in-service training prior to implementation. These training-related functions may also present opportunities for EMS providers, as peer trainers and instructors are often used.

It is important that providers of EMS and trauma care take the time to learn about their state's activities. Local involvement will enhance the success of the federal renaissance and its primary goal of organized systems of trauma care throughout the United States.

All authors are staff members or consultants with the Division of Trauma and Emergency Medical Systems, Bureau of Health Resources Development, Health Resources and Services Administration, U.S. Public Health Service, Department of Health and Human Services. Douglas M. Wolfberg is a DTEMS pre-hospital systems consultant. Diane McMenamin is the DTEMS deputy director. Mirtha R Beadle is a DTEMS EMS consultant. Dr. Christoph R. Kaufmann is a trauma surgery consultant. Judith B. Braslow is the DTEMS acting director.

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CHRISTINE M. ZALAR, BSN, MA

Becoming an effective leader

EMS managers, much like their counterparts in the business world, are struggling with the transition from managerial processes that seemed to work in the past, but no longer work in today's dynamic work environment. In the past, effective managers simply managed. An autocratic management style was common—dominated by one-way communication and telling people how to accomplish their jobs. The end result was obvious, a rift between management and employees occurred, leaving managers isolated from the input of others.

This challenge is further compounded by a confusion about what constitutes management and leadership. Leadership occurs at many levels and takes on a number of different forms throughout any EMS organization. People have struggled with whether leadership is an innate quality or a learned skill. The dictionary definition of leadership is "the ability to lead." In essence, leadership inevitably requires some degree of authority or power to influence the thoughts or actions of others.

On the other hand, Webster defines manager as "a person charged with the control or direction of a business, or who controls or manipulates resources." There is some common ground between manage and lead. Both refer to dominating or influencing others as well as having responsibility to succeed in accomplishing something.

Leadership and management complement each other. Although there are inherent differences between the two, both are necessary for success in an EMS organization. Most EMS organizations are overmanaged and underled. Part of this is due to the lack of distinction and appreciation for the fact that not everyone can excel as both a leader and manager. Some individuals have excellent managerial skills but don't have the vision or ability to orchestrate the organization through sometimes difficult change. To become an effective leader, you must be able to discern the characteristics of good management and good leadership. Then, you must be able to apply those characteristics to yourself and your environment.

Effective management in EMS is seen in the individual who can effectively cope with the complexities of operational decision making and organization. Good managers are able to bring a degree of order and consistency to the key dimensions of the organization, such as the process that results in ambulances being at the right place in the right amount of time with effective working tools and equipment to provide excellent patient care.

> **Leadership achieves change through motivation, inspiration, and the ability to energize people toward new goals.**

Leadership, on the other hand, focuses on how an individual copes with change. Excellent leadership in EMS is exemplified by the ability to foresee changes on the horizon such as technological advancement, regulatory oversight, demographics and needs of the work force, and to direct the organization's reaction or adaptation to those changes.

We can further contrast managing and leading by looking at some common processes such as planning and budgeting. Managers will detail the steps for how to achieve targets and goals, and how to allocate resources to accomplish them. The leader will look for constructive change by setting a direction that focuses on a vision for the future and the organization's position in that future.

Another common management activity is organizing and staffing; creating the human resource infrastructure to accomplish the goals of the organization. The equivalent leadership activity is to develop consensus toward new directions and goals. In an active and collaborative role, the leader communicates new direction to those who can create coalitions, share in the vision, and remain committed to fulfilling the vision and its goals.

Management is exemplified by controlling and problem-solving in the achievement of its plans. Monitoring the results vs. the planned activities are functions of a good manager, as are planning and organizing to identify deviations and present solutions. The focus of management is to produce the desired results by coordinating and orchestrating the factors of production. Leadership focuses on achieving a vision that requires motivation and inspiration, progressing in the right direction despite obstacles to change, and energizing the organization through human needs, values and often emotions.

Several key activities can be highlighted to help clarify the skills to become a better leader.

Induce change by effectively setting the direction of that change. Giving direction is more inductive than its counterpart, planning. Leaders look at a broad range of information and data, analyze that data for patterns, relationships and linkages that help to produce vision and strategies. Managers, on the other hand, produce plans to implement strategies to realize particular visions.

The vision of leadership is not a mystical, charismatic characteristic. There is nothing magical or mysterious about developing good business direction. It is an exhausting process of gathering and analyzing information, and learning how to sort through what is key and relevant.

Managers who are able to develop or communicate visions are basically broad-based, strategic thinkers who are willing to take risks.

Managers align people. They organize human resources to implement the plans, and schedule those resources as precisely and efficiently as possible. A good EMS manager will be able to accomplish this complex task by structuring jobs and scheduling resources to best meet the demands. In addition, a good manager will staff positions with individuals suited to the jobs, provide training and quality improvement oversight for the results of their work, communicate the plans to the work force and effectively decide how to delegate authority. Further, managers create economic incentives that will be tied to job performance.

Leaders take a different approach in dealing with people. Alignment is more of a communications challenge than it is a problem of designing good and effective schedules for personnel. Aligning requires more communication than organizing does. The leaders' interpersonal skills are much more drawn upon than those of the manager. The target population for the leader is not only subordinates, but also bosses, peers and outside constituencies. The leader looks for anyone who can implement and fulfill the vision and strategies of the organization, as well as those who may block implementation.

In other words, if the staff understands where the organization is going, they are more willing to take risks. Because everyone is essentially aiming toward the same goals, there is less probability that an individual's initiative would be stifled when it comes into conflict with someone else's.

Change is a key function of leadership. Therefore, energizing behavior is critical for coping with the barriers to change. Leadership achieves change through motivation, inspiration, and the ability to energize people toward new goals. Energizing satisfies basic human needs for achievement, a sense of belonging, recognition and self-esteem—all of the basic elements from Maslow's Hierarchy, which demonstrates the necessity to meet people's basic needs first.

Good leaders are able to motivate people in a variety of ways. First, they are able to communicate the organization's vision while stressing the values of the audience. This places more importance on the work being performed. Leaders also regularly involve people in deciding how to achieve that organization's vision. Obviously, this allows for people to have a greater sense of input and control over their work environment. Good leaders motivate their workers by recognizing and rewarding success. As a result, workers develop a sense of accomplishment and a feeling of ownership of the organization and its goals.

Within the hospital care environment, the role has been heavily focused on following algorithms or protocols, and in essence "doing" and managing a patient's care, one case at a time. The transition to managing the organization

employs some of those same skills.

However, as individuals transfer to supervisory and managerial positions, people skills and the ability to supervise others often become complicated by the algorithmic technical approach that often was the foundation for effective patient care management. People skills requiring planning and organizing the work of others; communicating effectively with such techniques as praising and coaching; and ultimately helping your staff grow into contributing organizational team members are not skills easily acquired or practiced prior to a supervisory position. The transition from the technical expertise to a supervisory and then a managerial expertise is a difficult path. It is even more formidable to develop the skills of effective leadership.

As outlined above, there is distinction between an excellent manager and an exceptional leader. Some people have the capacity to do both; they are rare. Good managers rely heavily upon excellent leadership to guide the organization forward. In turn, good leaders are limited only by the ability and strength of the managerial expertise upon which their organizations are run. There is tremendous interdependence between the characteristics and the roles of these two unique focuses of business development. Understanding and respecting the significant contribution of each allows the organization to achieve its success.

Leaders are open communicators who provide information, as well as listen to the input of others. In essence, they have mastered two-way communication.

Leaders are lifelong learners, always seeking to gain more information and insight. They profit from their mistakes and share the secrets of their success.

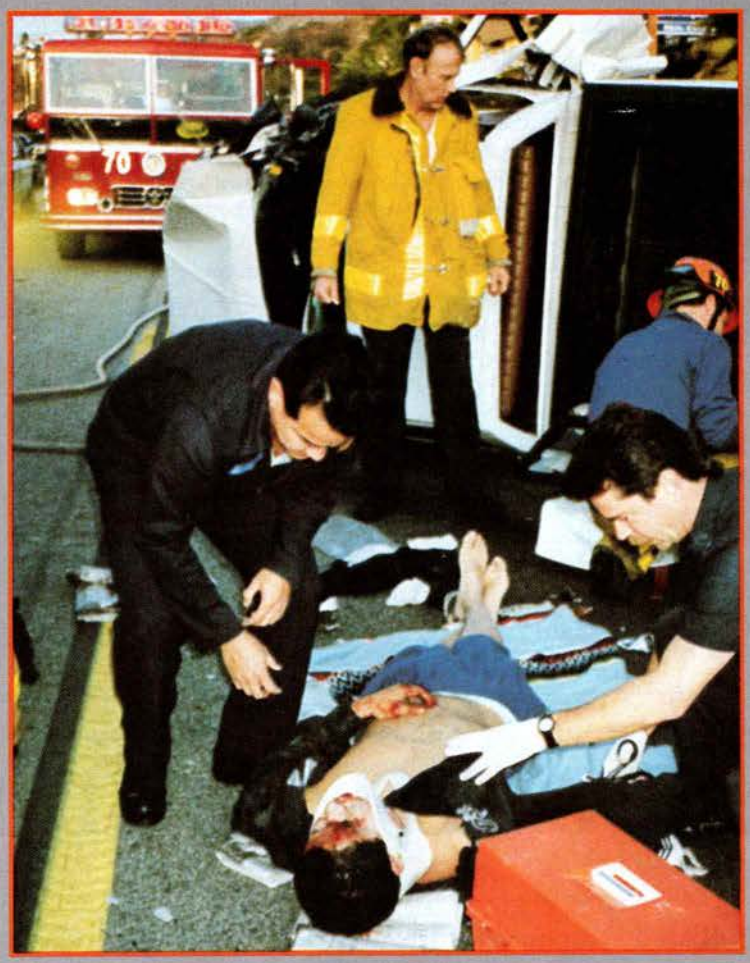
Leaders exhibit confidence and gain respect by making decisions and taking actions that are based on knowledge, integrity, and the ability to focus on the greater vision and directions.

Becoming a better leader requires being able to deal with intangibles better than your EMS managerial counterparts. Conceptualizing an organizational direction, and communicating that concept, is not a skill people are "born with," but rather an art that individuals can learn.

Becoming a better leader in EMS requires significant risk-taking. It also requires the ability to gather data and formulate answers that are uncommon. EMS leaders are responsible for ascertaining and setting the direction of their organizations, as well as for creating a healthy organization that progresses on that journey.

Becoming a better leader begins with understanding the difference between leading and managing. Aspirations toward becoming a leader can thus be fulfilled when an individual recognizes the responsibilities and accountability which come with that role. E

Christine Zalar is a partner of Fitch & Associates, leading the air medical consulting services of the firm.



Members of the Los Angeles County Fire Department, Pruner Ambulance Service, and the Los Angeles County Sheriff's Department respond to a motor vehicle accident on Pacific Coast Highway in Malibu, Calif. The two patients were injured when the stolen vehicle they were driving rolled over. Although the passenger was ejected from the vehicle, the driver had to be extricated. After being immobilized and receiving IV therapy, both patients were transported to an area hospital where they were later arrested.

photos by ❖ *Michael Butler*

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TRIUMPH OVER TRAGEDY

EMERGENCY RESPONSE TO HURRICANE ANDREW

BY NANCY BELL

The deafening, bone-shaking roar. Homes caving in around their terrified owners. Cars, trees and whole buildings tossed through the whirling, boiling tropical night air, coming to rest miles from where they began. Heart-stopping terror and finally, destruction, loss and eerie silence.

Then the aftermath. The almost complete devastation of 400 square miles of south Florida saw huge areas with not one building or tree left standing. And the grim statistics: more than 90,000 homes and buildings damaged or destroyed; 250,000 people left homeless; and 86,000 out of work. With an estimated $20 billion in public and private property losses, Hurricane Andrew was the most expensive—and perhaps the most traumatic—storm in United States history.

JUSTIN WASILKOWSKI

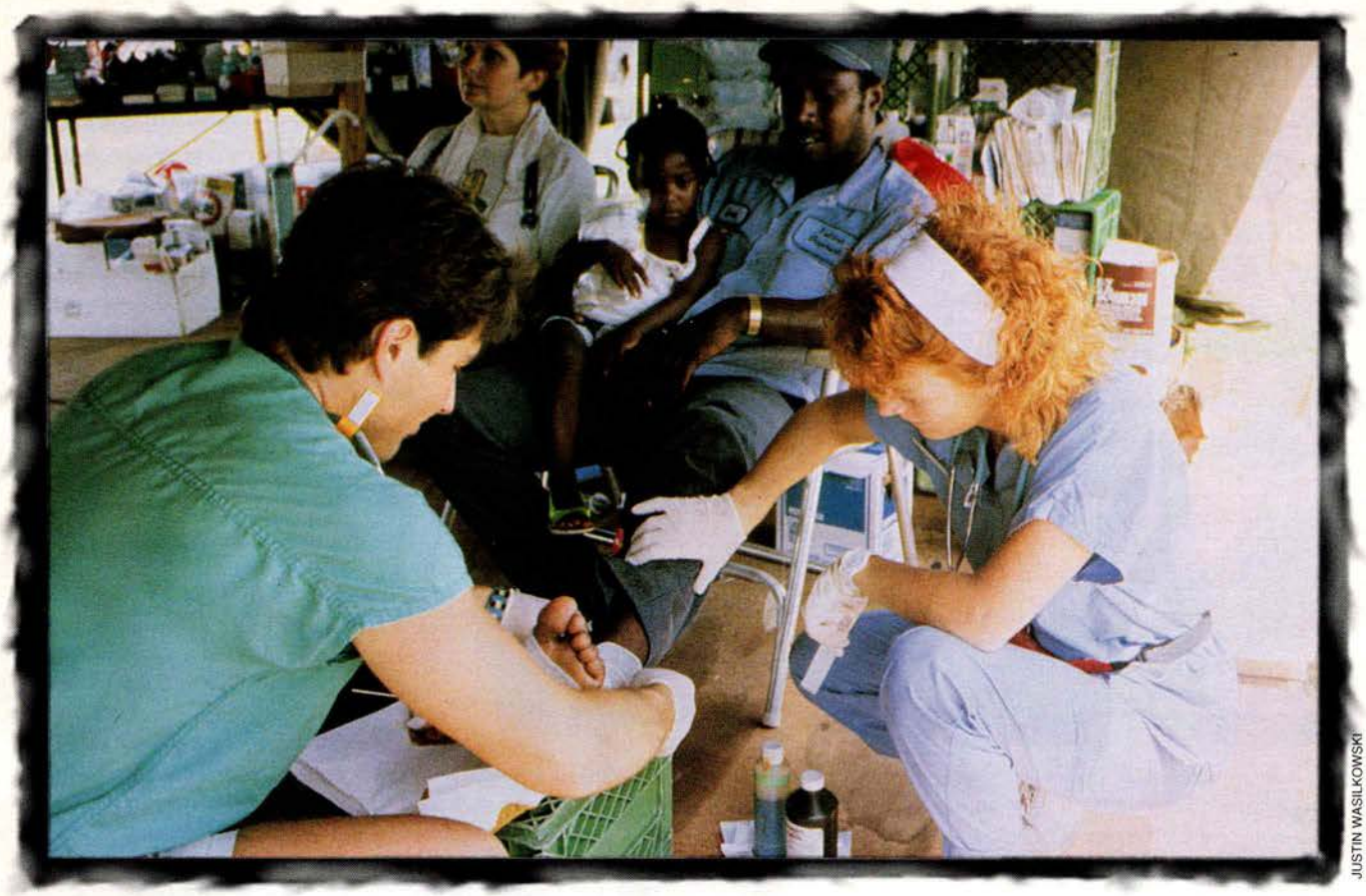
The killer storm, the first Category 5 (most devastating) hurricane to hit the United States mainland since Camille in 1969, roared across south Florida late at night on Sunday, August 23, 1992, with the eye of the storm over Homestead Air Force Base, 35 miles south of Miami, at 4 o'clock Monday morning. Winds were clocked at 164 mph, with gusts to 200 mph and up to an incredible 216 mph at the Turkey Point nuclear power plant. Homestead and Florida City were almost completely leveled, with the south Miami suburbs of Kendall, Cutler Ridge and Perrine also suffering serious losses. In its wake, Andrew left the ruins of south Florida with no power and little phone service. Downed trees, power lines, overturned cars and parts of buildings clogged streets and made large areas impassible.

"When I was called to duty at 7:45 a.m. on the morning after Andrew hit, my first thought was that this was what Hiroshima must have looked like after the bombing," recalled Assistant Chief Carlos Perez of Metro-Dade Fire Rescue. "It was almost total devastation—no trees, buildings or familiar landmarks. You really can't describe it to someone who wasn't here."

Yet in spite of the mass devastation, fatalities and injuries were incredibly low. There were only 32 deaths directly associated with the storm, with just 15 of those trauma related. Eighteen additional deaths, such as heart attacks and accidents, were indirectly related. "I attribute the fact that there were so few deaths to what was the most efficient evacuation in U.S. history," said Mike Williams, EMS director of Florida. "One million people evacuated before the storm hit. The weather service and the media did an excellent job of convincing residents that this was the real thing and they were in danger."

JOBS WELL DONE

For those who remained, perhaps the real heroes were the local EMS personnel. "The media focused on what the military did, but I'll tell you, it was the local EMS troops who held this community together. Many of them were left with no homes, their families unaccounted for or in jeopardy, their stations



JUSTIN WASILKOWSKI

badly damaged, no power or phones, gas leaks, fires, limited water—real battlefield conditions," said W.J. Alvarez, deputy chief of Metro-Dade Fire Rescue. "The most heroic aspect of the whole experience was the ability of our EMS professionals to respond to the disaster and serve the public, in spite of the fact that most of them were victims, too."

As it happened, Hurricane Andrew scored a direct hit on Metro-Dade Fire Rescue's territory. Dade County has six fire departments, including Metro-Dade, an integrated service that governs EMS services as well as firefighting, with 39 fire stations and 31 paramedic units.

Did it simplify or complicate the disaster response to have the storm hit primarily in one agency's jurisdiction? Both, says Alvarez. It simplified response in terms of interagency command and control for rescue and recovery, but it was more complicated because so many of Metro-Dade's EMTs and their families and homes were also victims of the storm. "That 'rescuer as victim' scenario was something we'd never experienced before," Alvarez said. "It had major repercussions."

> "THE MOST HEROIC ASPECT WAS THE ABILITY OF OUR EMS PROFESSIONALS TO RESPOND, IN SPITE OF THE FACT THAT MOST WERE VICTIMS, TOO."
>
> -W.J. ALVAREZ
> METRO-DADE FIRE RESCUE

Immediately following the storm's passage, there was much criticism and finger pointing regarding delays in federal and state response to the crisis. Williams, Alvarez and Perez all agree it was difficult at first to assess the magnitude of the devastation because of the downed communications. "Both our helicopters were destroyed," said Alvarez, "and from the ground, depending on where you were, your perspective differed on how bad it really was. Once we got military helicopters, we could see how vast the devastation and need for help really was."

Once the storm's ferocious winds died down and it was safe for Metro-Dade to respond to calls, their troops went into action. "We had 300 to 400 calls holding (from residents who still had phone service). It's impossible to say how many calls we actually got because our vehicles were continually stopped on the street by people needing help. It was mass confusion from the word go."

EMS units were severely handicapped in responding to calls because the damage to south Dade County was so total, it was like a foreign landscape, even to those who'd grown up in the area—no visual clues, street signs or familiar landmarks. If a neighborhood could be located, a street couldn't be found. Once what had been a street was identified, finding what had been someone's house was another challenge. It was a tremendously stressful and disorienting experience to EMS personnel already worried about the safety of their own homes and families.

"I've been through all kinds of disasters—riots, plane crashes and so forth—but Hurricane Andrew was different because it was so vast and overwhelming," Perez said. "It was more difficult to cope with this one because it was hard to determine priorities. It took tremendous concentration to take one task at a time and deal with the issue at hand on a micro level. The dispatchers were fantastic. We had a division chief, Drew Keyes,

JUSTIN WASILKOWSKI

who recognized how overwhelming the volume and types of calls would be right after the storm. He had the sense to prioritize calls and feed them slowly to the dispatchers. In the field, EMTs had to fight to concentrate on one call at a time in order to keep any sense of control."

As soon as the rest of the country realized how massive the destruction from Andrew had been, Metro-Dade Fire Rescue was overwhelmed with outside help. Williams and his staff began manning the Florida Emergency Center in Tallahassee on Friday night in anticipation of Andrew's landfall, though no one had any idea how destructive the storm would be. "On Monday at 2 p.m., I got a call from Bob Garner, vice president of Randall-Eastern Ambulance," Williams said. "He said, 'I am standing in the middle of my neighborhood and it's gone!' That was the first on-scene report we had on how bad things really were."

Florida Governor Lawton Chiles ordered EMS providers statewide to Miami to act as a clearinghouse and resource for incoming responders. With more than 300 calls an hour pouring in from volunteers, coordination was sorely needed. A joint medical task force was created that included the U.S. Public Health Service, Department of Defense, Department of Veterans Affairs, state health resources (including Metro-Dade Fire Rescue), and the State Hospital Association.

Volunteers: A Mixed Blessing

"We were not prepared for the huge influx of volunteers from all over the country," Williams said. "They fell into three categories: those who were willing to respond in an organized manner; the self-declared 'heroes' who had to charge down there immediately and get busy saving lives; and those who didn't even call—they just went down and set up shop on street corners. We had everyone from voodoo doctors to faith healers to legitimate professionals pouring in here."

EMS reinforcements from all over the United States (more than 400 EMTs) were also a mixed blessing. The first arrivals relieved exhausted Metro-Dade troops so they could go home to see if their homes were standing and their families safe. With the huge volume of calls and tremendous need for help, the reinforcements were greatly needed and appreciated. Yet housing, feeding and coordinating the activities of that many new people presented a huge logistical problem. Alvarez referred to it as "managing the second disaster." He continued, "You can't just pour relief and volunteers into an area without a way to house and feed them, store equipment and manage all these people from completely different departments and disciplines. It involves taking away resources from rescue and response to create a cohesive workforce overnight. By the time you get organized, your needs have changed completely."

During the first few days after Andrew hit, Metro-Dade spearheaded a massive search and rescue mission, covering 600 square miles with 450 searchers a day combing through destroyed neighborhoods and remote areas of the rural south county. Block-by-block, teams of 30 searchers plus two dog teams looked for missing or injured survivors and bodies until darkness fell and they could work no longer. Incredibly, they found no one.

Crews often had to cut their way out of fire stations damaged during the storm and hike into neighborhoods where roads were impassable. Metro-Dade Fire Rescue luckily had the foresight to purchase 80 chain saws several years ago. They were stored in a warehouse and brought out the day before the storm hit. "We learned that lesson from the hurricane in South Carolina," noted Alvarez.

Public Health Response Praised

One relief faction that received high praise from nearly everyone was the federal public health team, headed by Dr. Ellery Gray, the senior emergency response coordinator for the U.S. Public Health Service. "If it hadn't been for them," Perez said, "we'd really have been in trouble. They saved Dade County."

Gray was part of a team sent to Miami to assess needs and plan the emergency public health response. He became the Incident Commander for the Management Support Unit that administers the National Disaster Medical System (NDMS). The NDMS is a group of four federal agencies: the Veterans Administration (VA), the Department of Defense (DoD), the Federal Emergency Management Agency (FEMA) and the Department of Health and Human Services (HHS). The U.S. Public Health Service falls under HHS and takes the lead in administering the NDMS in the event of a national emergency.

The Public Health Service deploys DMAT teams of volunteer civilians from around the United States who respond to disasters as needed. DMAT teams are typically made up of about 35 members including four physicians, five or six nurses, EMTs and first responders. Teams are linked with hospital beds, transportation systems and other resources that can be called into service during a crisis.

Fourteen DMAT teams responded to Hurricane Andrew, a far greater number than had been called together before. Hurricane Hugo, for instance, deployed just three DMAT teams. "It was rough in terms of command and control," admitted Gray.

"These teams were accustomed to operating independently and based on the Hugo experience, we were just in the process of developing a system for coordinating numerous teams when Andrew hit. In spite of everything, it went remarkably well."

The DMATs, which saw a total of 10,000 patients, acted as self-contained field hospitals with full emergency capabilities that triaged, treated and released or transported patients by private ambulance to hospitals outside the affected area. This transport function was especially important because Andrew devastated south Dade's two hospitals, Homestead and Deering. Williams described how Deering had been battened down during the worst of the storm and expected to ride it out with little damage. As staff and patients huddled inside the building, which had built up tremendous air pressure, suddenly an entire family began pounding frantically on the emergency room door, begging to be let in for shelter from the storm. Though staff knew the danger of opening a door at that point, true to a hospital's mission, they did so. As the family scurried inside, the changed air pressure caused all the hospital's windows and doors to explode, devastating the hospital completely.

WITH MORE THAN 300 CALLS AN HOUR POURING IN FROM VOLUNTEERS, COORDINATION WAS SORELY NEEDED.

In addition to the DMATs, the Florida National Guard set up two aid stations which saw 11,588 patients, according to Williams' records. The VA's mobile medical vans treated 5,102 patients and the Army's 82nd Airborne saw 39,000 people. Interestingly, very few were trauma patients. "Hurricanes don't usually result in a lot of injuries," explained Gray. "Many residents evacuated in time and of course during a hurricane you don't have as many car accidents or shootings. Instead, you see heart attacks, exposure illnesses and lots of injuries and falls when people start clearing their property with chain saws and other equipment they aren't used to using. Our job was to treat and stabilize them and get them transported to a hospital farther north if necessary."

Another big problem was securing maintenance drugs for people with chronic health problems such as high blood pressure, diabetes and AIDS. Gray's Public Health Service teams set up a medical warehouse at a small airport north of Miami, which made deliveries to field sites. Gray estimates they brought in approximately $5 million in medical supplies, in addition to drugs received from distributors in Miami.

Gray was also appointed by President Bush as senior federal coordinator for medical and health response, which meant he was responsible for coordinating efforts with other agencies. He formed a health and medical task force that, by mid-week after the storm, met every morning to assess and act on community needs. "That coordination allowed us to move into other areas of health care such as preventive medicine, pharmaceutical needs, animals, the environment—whatever needed to be done."

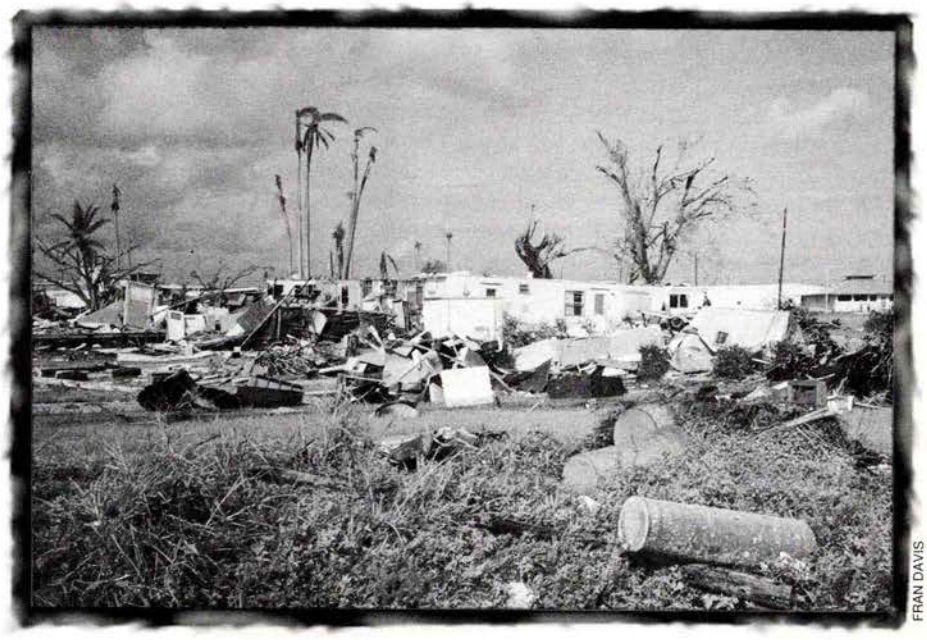
THE PSYCHOLOGICAL IMPACT

Any sudden disaster as overwhelming as Hurricane Andrew brings with it a tremendously negative psychological impact, both on emergency services workers and the public. In fact, experts say the psychological aftermath of Andrew is likely to be felt by nearly everyone who lived through it for at least two years.

Perhaps the first mental health response to the crisis was the arrival of Critical Incident Stress Debriefers (CISD) of Florida. CISD is a psychological and educational process designed to reduce and control the impact of critical incidents on emergency service providers. Over a period of 32 days following the hurricane, CISD support was provided to local fire, EMS, law enforcement, public safety and park service personnel affected by the disaster. A total of 121 members from regional CISD teams around the country responded to the need for psychological support. In teams usually consisting of one mental health professional and two public service peers, 537 debriefings, one-on-one counseling support and educational sessions were held for a total of 3,779 EMS personnel in south Florida during a 32-day period. Those who needed further help were referred to other mental health resources.

Fran Davis, a social worker who is a member of the Tampa CISD team, was among those who traveled to Miami to help with psychological support for emergency service workers. She worked with a number of Park Service personnel and tells of several research scientists trapped during the worst of the storm in a van buffeted about and overturned by high winds. "I remember one of these scientists, a very bright and ordinarily articulate man, who was so traumatized by the terror and life-threatening nature of the experience that he reminded me of a shell-shocked war victim. He was like the walking dead. He couldn't talk or even function. Someone like that needs a lot of ongoing support to deal with the after-effects of the trauma," said Davis.

(Continued on page 66)



FRAN DAVIS

Dependability in Disaster

The helping hand of the National Disaster Medical System

by Robert A. Ball, EMT-P

Catastrophic mass casualty incidents (MCIs) happen with relative frequency. All you have to do is look at the newspapers, which list casualty reports for any number of earthquakes throughout portions of the former Soviet Union, or volcanic eruptions in the Philippines. Even in the aftermath of Hurricane Andrew and Hurricane Iniki, Americans have been fortunate that casualties have remained relatively small and manageable, to a great extent, on a local or statewide level ... so far.

Even so, the potential for disaster is not only present, but increasingly likely. This is not only due to the increase of hazardous materials in our communities, but also to the increase of population. In 1857, an earthquake occurred in Fort Tejon, Calif., located in the Kern River Valley near Los Angeles. While the quake was rated an estimated 8.0 on the Richter scale, no deaths or injuries were reported. That was because the area was largely uninhabited. Today, more than 10 million people live in the Fort Tejon area. Should a similar earthquake strike there today, an estimated 3,000 to 14,000 people would die, and up to 55,000 would be injured.[1]

Providing disaster relief is historically the responsibility of the individual states. In fact, since disaster relief is not mentioned in the Constitution, such interference by the federal government was considered unconstitutional and illegal in the 19th century. The first example of federal disaster aid occurred in the aftermath of the 1906 San Francisco earthquake. Under orders of General Frederick Funston, then commander of the United States Army forces in the San Francisco area, the Army was mobilized to provide relief. While the legality of this action was questionable at the time, the necessity was so obvious that regulations would be changed to allow the relief action after the fact.[1]

Since then, United States military forces have assisted in providing disaster relief in the areas near their installations, when requested by local officials. While legal, this method was simply an informal act of kindness on the part of the federal government, and not part of a plan for federal disaster relief services.

President Reagan ordered the creation of the Emergency Mobilization Preparedness Board to oversee domestic disaster relief. Under this board, the National Disaster Medical System (NDMS) was created to provide medical assistance to disaster stricken areas where the number of casualties overwhelms the existing medical resources.

The NDMS is a joint operation of the Federal Emergency Management Agency (FEMA), the Department of Defense (DoD), the Department of Health and Human Services (HHS), and the Department of Veterans' Affairs (VA). It also involves the public and private hospitals that are part of the Civilian-Military Contingency Hospital System, originally designed to provide a reserve of acute care beds in case of high military casualties.

When requested, the NDMS will respond to supplement state and local medical resources during peacetime disasters. In the event of a national security emergency, the NDMS works to provide backup medical support for the military's domestic medical system.

The National Disaster Medical System has three primary objectives:

- to provide medical personnel and supplies to help existing medical resources with treatment and staging of patients at the disaster site;
- to provide transportation for patients who cannot be treated definitively at the

Photos (clockwise from top left): Monte Farnes, Brooke Hallman, Scott McCloskey, Fran Davis, Baltimore County Fire Dept.

Rethinking Triage

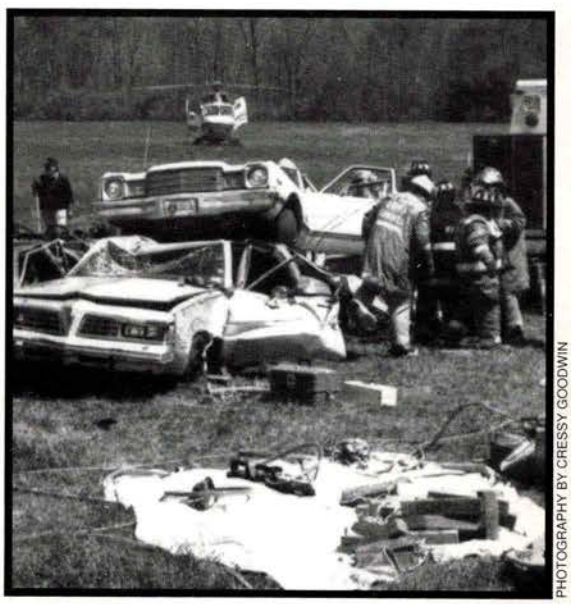
Are traditional measures working?

By Cressy Goodwin, REMT-A, MPH

A paradigm is a model or pattern with rules defining behavior. A family is an example of a paradigm. Those who work within EMS find themselves in another paradigm. Each paradigm has its own separate rules regarding behavior. When we work within a paradigm, we rarely need to stop and think about the rules. The advantage a paradigm offers is its ability for people to work together with common expectations. As EMTs respond to a cardiac arrest, they prepare to start CPR. This is done without having to consult state statutes or ask for medical guidance. The responsibility for administering CPR rests with the EMT. In the EMS primary care paradigm, the rules defining behavior are understood and internalized; one does not have to think them through.

The disadvantage of a paradigm is the instinctive, often intense rejection of new ideas and ways of doing things seen as unnecessary or contradictory. "Why should we change what we are doing? It's worked well enough so far!" is a common reaction to a proposed shift in a paradigm.

Triage represents another paradigm within EMS. The national standard curriculum for basic EMT training defines triage as: "sorting multiple casualties into priorities for emergency care or for transportation to definitive care." Note the availability of resources is not stated in this definition. Perhaps it is assumed. After all, EMTs know what resources they have with them. However, initial care decisions with multiple patients are routinely made by fire, police or other first responders before EMTs arrive. Federal Occupational Safety and Health Administration (OSHA) regulations require multiple agency responses to haz-



PHOTOGRAPHY BY CRESSY GOODWIN

THE TACTICS OF EVERYDAY TRIAGE COLLAPSE UNDER THE WEIGHT OF A LARGE NUMBER OF PATIENTS SIMULTANEOUSLY IN NEED OF EMERGENCY CARE.

ardous materials incidents be controlled by implementing an incident command system (ICS).

Formal command of these multiple public safety responders is now being accomplished. This type of structure was organized to work well in responding to events with multiple casualties, with or without a haz mat incident. The ICS established by the National Fire Academy (NFA) identifies that for a mass casualty incident, *triage* is of central importance—enough so as to identify an officer level position for this function. The assumption is made that triage in an ICS follows the same paradigm as smaller, more routine EMS events. The tactics of everyday triage collapse under the weight of a large number of patients simultaneously in need of emergency care. A more precise definition of patient triage is needed: For example, sorting of two or more patients, considering the severity of the condition to establish priorities for emergency medical care using available resources.

In many EMS courses, the principles of triage are taught with examples. One of these principles is to save the greatest number of lives. Thus, patient care assignments will be based on quick judgments concerning which available resources will be tied up measured against the probability of saving lives. Consider two EMTs arriving at a scene where there are two patients. While the patient in cardiac arrest would benefit from immediate two rescuer CPR, one of the available technicians should first control the other patient's bleeding. Such a triage decision would have the greatest chance of saving both patients.

The traditional triage paradigm defines a single common method. Patients later can and should be retriaged; but this is done the same way as before. Changing patient conditions and newly available resources are considered in redirecting efforts to those with the greatest need. The traditional triage paradigm assumes every patient can be assigned adequate resources rapidly. If a critical condition or injury is overlooked, the patient initially receiving a lower priority will soon have their problems addressed as other EMS units arrive.

The incident command system is flexible and serves to organize responders to "routine emergencies" as well as large scale events. The traditional paradigm of triage fails when the number of patients overwhelms resources.

Several authorities in New England informally surveyed local groups and reviewed large scale operations and exercises to measure this phenomenon. A consensus emerged in 1981 that most EMTs making triage decisions remained comfortable with a delay of under 15 minutes. In events where the number of patients exceeded the number of ambulances expected in 15 minutes, EMTs started to lose confidence in traditional triage decisions. This was shown by several observed phenomena: a tendency to remove patients in the order encountered by EMTs; the loading of more than two patients at a time in ambulances; and moving patients from the scene as fast as possible to the hospital, often without any field care.

Another sign of the failure of traditional triage with large numbers of patients is shown by a review of hospital "disaster plans." Many plans assume there will be large numbers of untriaged patients arriving in a short period of time with minimal prehospital emergency medical care. Thus, many staff members are called to the facility entrance to initiate triage and offer immediate resuscitative care as each patient arrives. These, however, are not the usual activities of a hospital staff receiving critical trauma patients. Changes in the triage paradigm at a hospital are mandated by the inadequacy of the traditional field triage paradigm at a large scale event. The EMTs' inability to triage a large number of patients is not the fault of their training or abilities. It is the model, the pattern, the paradigm of traditional triage that has failed.

After a tornado in Connecticut in October 1979, the New England Council for EMS Inc. formed a Mass Casualty Care Planning Committee. This group undertook an analysis of why patients in large scale events failed to receive the same standard of prehospital care routinely delivered. Among the major reasons identified was the system of triage.

For a shift to a more efficient triage method to become effective, a threshold for sizing up a local event is needed. The threshold depends on the number of local resources available within a reasonable time interval (15 minutes). If each ambulance transported two patients, then one more than that number becomes the threshold for any locality. Qualitative factors are also considered. For example, if all patients have minor injuries, the threshold number can be exceeded without the need to declare it a mass casualty incident (MCI). Once an event is declared a mass casualty, additional protocols must apply to effectively organize responses.

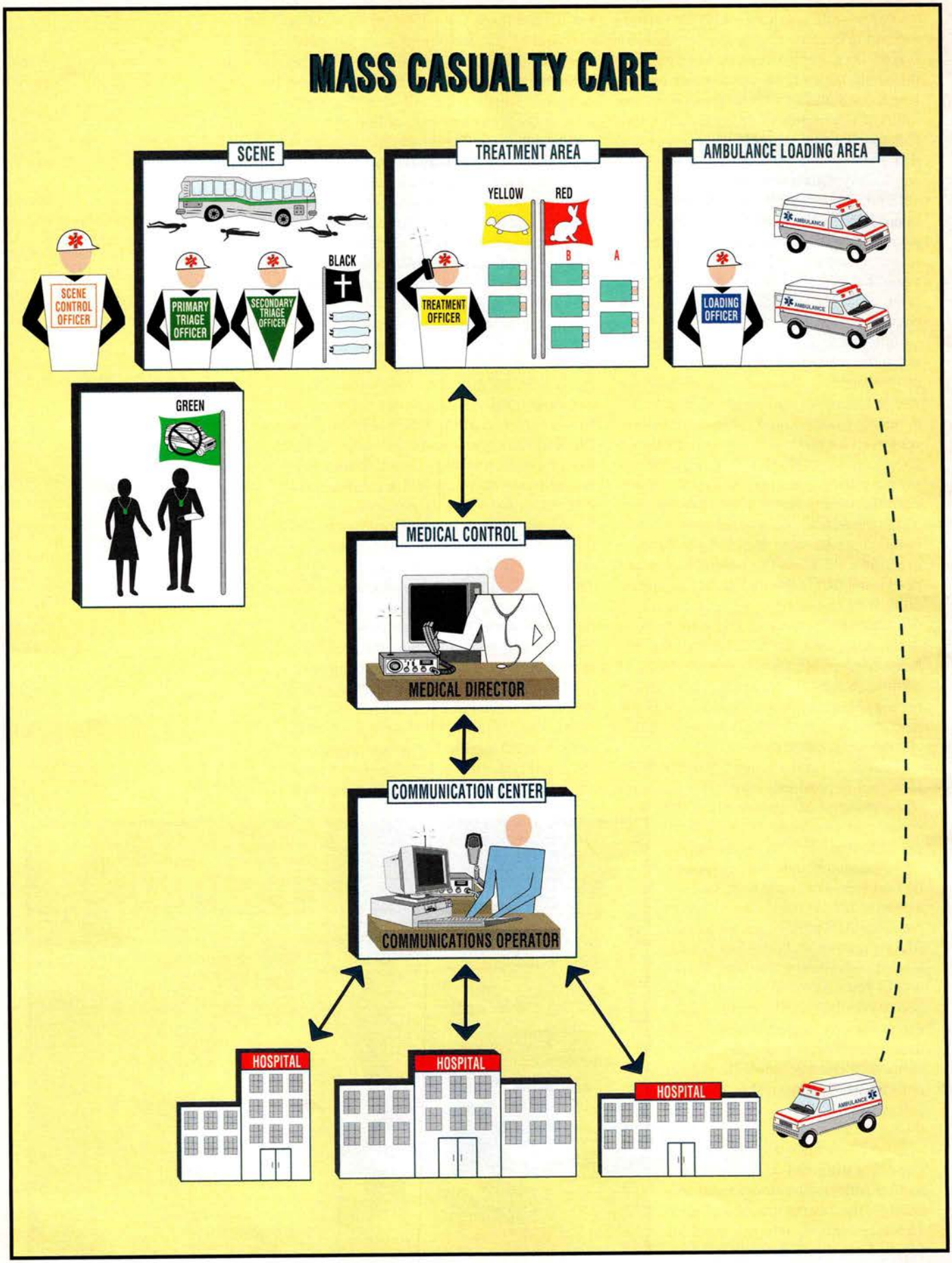
Inherent in an MCI is the lack of personnel sufficient to meet the immediate needs of every patient. As part of an initial triage step in a declared MCI, performance of CPR is not always indicated. This can conserve resources for other patients with life-threatening needs in the first of four triage steps—**primary triage** (as opposed to primary survey): bleeding wounds, airway management and management of the rapid onset of deterioration of vital signs due to shock. Because denial of CPR when the patient is clinically dead is not part of the traditional EMS protocols, it is imperative when initiating a response at a large event that it be formally declared an MCI. In New England, the declaration of an MCI rests with the incident commander. Such declaration then authorizes a change in protocols much as in the fire service a second alarm indicates a change in the attack plan.

During several events, problems were identified in providing care to the standard of the routine EMS system where the patients are first found or are taken to safety. In one event, large numbers of marchers in a parade were overcome by heat exhaustion and were taken to a nearby athletic field. Those patients requiring ALS were scattered, leaving ALS equipment and drug boxes unattended. Establishing a treatment area would have allowed patients with severe conditions to be grouped near each other to conserve and coordinate limited ALS resources. A treatment area can also separate critical patients from bystanders, provide police security and offer shelter from the weather.

The need for a treatment area creates a different triage function: sorting patients by priority for evacuation to the nearby treatment area. Three reasons dictate the need for triage. First, those patients in greatest need of care should not be delayed in arriving at the treatment area for care. Second, enough equipment may not be available and, therefore, may need to be rationed. Third, there will be EMTs available in the treatment area at first and they should focus on those patients in greatest need. This is **secondary triage**.

Evacuation priorities for patients to be removed to the treatment area require a coding system visible by other EMTs approaching the patients. Most field triage systems use a standard color coding system with red reserved for those who are in greatest need for emergency medical care. Also required is a means to identify where each patient was located at the scene as their tag was applied. In New England, a commercially available tagging system was selected to categorize patients for priority transport to the treatment area. Protocols in New England identify an exact color coding definition, a patient tracking system, communication of triage decisions and accounting procedures as part of this triage step.

Initially, these triage priorities for life-threatening emergencies and evacuation were conceived as a combined triage step. The traditional triage paradigm was followed. The idea was evaluated in field settings culminating in an exercise held in 1981 in Wethersfield, Conn. Several problems were identified. Placing tags takes time. It delays the triage officer from arriving at the side of all victims quickly. In an event with 35 patients, there would be a 25-minute delay in reaching the last patient to correct any life-threatening emergencies if it averaged 45 seconds to evaluate and tag each


MASS CASUALTY CARE
SCENE
TREATMENT AREA
AMBULANCE LOADING AREA
SCENE CONTROL OFFICER
PRIMARY TRIAGE OFFICER
SECONDARY TRIAGE OFFICER
BLACK
YELLOW
RED
B
A
TREATMENT OFFICER
LOADING OFFICER
AMBULANCE
GREEN
MEDICAL CONTROL
MEDICAL DIRECTOR
COMMUNICATION CENTER
COMMUNICATIONS OPERATOR
HOSPITAL
HOSPITAL
HOSPITAL
AMBULANCE

patient. Triage officers have reported it was easier to focus more on the application of tags than on discovering life-threatening problems. Other evaluation has shown this to be a recurring problem. Perhaps this is a function of the tagging process involving equipment and supplies that are colorful and distracting. Many have reported their lack of familiarity with the tags and the presence of the tags caused their attention to remain focused on them. Under stress, many responders have said they want to focus on details to avoid distractions and help them cope with the situation. They have reported it easier to focus on visual stimuli. Finally, primary care must continue for as long as there are patients outside the treatment area where it takes only one pass-through of a group for the tagging to be completed.

Life-threatening problems can emerge over time as individual pathophysiological changes occur. Where a patient airway existed a few minutes ago, it might become compromised as the patient's level of consciousness changes. Primary triage must continue for as long as any patients remain at the scene. In New England, a decision was made to separate these functions over time just as patient assessment (not triage) is divided when an EMT treats a single patient.

The first step of triage, therefore, involves evaluating the group for only three life-threatening or primary conditions. One of these, the third, rapid deterioration of vital signs due to shock, requires a follow-up evaluation of patients to track their deterioration over time. During the first evaluation of the group, only hemorrhage control and airway management are required. This is not done by correcting everyone's airway first, then going back to manage any bleeding. Each patient is quickly assessed for either bleeding *or* airway problems. As there are only two (later three) conditions being evaluated, the sequence with which they are thought of is not critical. Only if multiple conditions were found in the same patient would the correction be given a hierachial order following traditional EMS procedures, omitting CPR only in a declared MCI.

Considering the group is one body, this results in **primary triage** (**B**leeding, **A**irway and rapid **S**hock), followed later by a **secondary triage** step (**I**mmobilization after **C**lassification). These letters form the acronym: "Care at the scene is **BASIC**."

With a shift in the triage paradigm that allows consideration of multiple triage steps separated by time, a **third step of triage** is possible to consider. As patients first enter the treatment area, there may be inadequate numbers of EMTs. This is especially true of ALS personnel. The need is to subdivide the red-tagged patients to identify those with a higher need for care. Thus, a red-tagged patient with a closed skull fracture and dyspnea can be given a higher priority than another with a fractured arm and moderate shock. In New England, a letter "A" is written on the tag for the higher priority red-tagged patients. These people are led to a designated section in the treatment area.

The **"A/B sorting"** third step of triage is a method similar to the triage procedure used daily in the routine EMS system. Relative to the others who have been tagged red, each patient's priority is now ranked. The only change is the marking of the tags with an "A" or a "B." This subjective evaluation is possible after a brief time because the EMTs making these judgments now have a greater sense that the event is becoming controlled and stress is diminishing. Primary care issues have been addressed. Only a portion of the total patient population will be subjected to this triage step and resources will soon become available to meet the needs of the red-tagged group.

Following this third level of triage, back-up personnel are assigned to patients to provide care following **traditional** EMS protocols. A patient who arrests in the treatment area will now have CPR performed. Any patient in the treatment area who needs immediate evacuation to a trauma center will receive priority transportation following routine protocols. The **fourth level of triage** is loading priorities. The mass casualty organization is now established to support this. Individual EMTs do not need to know the detailed organization of an MCI for an

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operation to meet the needs of the patients.

The operational integration of these standards into the ICS is accomplished by making a separate officer responsible for each of the four triage steps. These four triage officers are responsible for triaging all patient care in their sectors. Individual officers are designated by titles which are standard throughout New England. Each is supervised by a fifth person reporting to the incident commander.

Fire, law enforcement and EMS responders all have roles to play in delivering patient care, including initiation of CPR. It is imperative that the declaration of an MCI be made early and by the incident commander.

Each of the four triage protocols making up the organization of an MCI in New England is taught to EMS personnel in formal Triage and Mass Casualty Scene Management training courses. Field training is included. It is now possible for instructors to accompany officers during major exercises to train participants to achieve the defined standards. Standardized evaluation of drills across the six New England states is being developed.

The ICS identifies medical operations with three sectors: triage, treatment and transport. While this implies a sequence of individual tasks with only one of these being "triage," there is no conflict when the triage paradigm shifts from a single decision-making point to a multiple step process for an MCI.

In the New England model, the ICS supports the function of "triage" with two officers doing primary and secondary triage before patients are taken to the treatment area. "Treatment" is a sector into which patients are triaged at a tertiary level. In the treatment area, pre-hospital care is given with traditional standards of the local EMS system. The "transportation" sector is where patient transfers to hospitals are coordinated following a fourth level of triage. The EMS MCI management system is consistent with and subordinate to the ICS. The detailed duties and protocols defined as standards for each of the triage officers serve as tactical procedures supporting the ICS. For those areas of New England where the incident command system is not yet operational, the four stages of triage with its internal EMS command structure is able to stand alone and has proven itself capable of helping emergency responders gain control of operations.

Patient care to the standards of traditional EMS is difficult to achieve at the scene of a mass casualty operation. Many factors influence the rapid evacuation of patients from the scene, frequently in a random sequence, in large groups and often with minimal field care having been rendered. Central to these influences is the inadequacy of the traditional EMS triage paradigm. In the day-to-day system of care, patients are initially sorted. Over time, by repeating the same process, the priority care assignments are upgraded or modified.

In New England, an alternative triage paradigm has been developed and extensively applied. In this approach, triage is broken into four discrete steps. Each step is different from the one before and relies on the previous steps being established before it is initiated. This sequencing of triage activity over time correlates with an increasing number of resources arriving and the need for increasing coordination and control over these resources. It also recognizes the absolute need to initiate life-saving care, even if nothing else can be done early in the operation with limited resources available. This system has demonstrated success in allowing the most critical patients to leave the scene first, with complete field care being rendered in a treatment area and while en route. Patients arrive at multiple area hospitals in decreasing order of severity, with time intervals between each arriving unit to allow maximum use of available hospital resources.

Cressy Goodwin is chairman of the Mass Casualty Care Planning Committee of the New England Council for EMS Inc. He is a certified EMS instructor in Connecticut, became a registered EMT in 1972 and remains a charter member of the National Registry for EMTs. He is currently the EMS Coordinator at Hartford Hospital.