NEW EMT SKILLS

In some states, EMT-Bs perform 12-leads & manual defibrillation

EMT-Bs in at least three states now perform 12-lead ECGs and transmit the results to hospitals to ensure rapid care for ST-elevation myocardial infarction (STEMI) patients. And EMT-Bs in one Wisconsin county have recently learned to do manual defibrillation to reduce hands-off time during CPR.

In May, Ohio gave its EMTs permission to do 12-leads; North Carolina did the same last year; and EMTs in a few parts of Wisconsin have been applying 12-leads and transmitting the tracings since 2006. Currently, no state allows EMT-Bs to interpret ECG tracings, but it could be allowed in the future.

"Some agencies in our very rural areas were EMT-basic [only], so this change was necessary to make sure [every] EMS agency in the state could have 12-lead capability," says North Carolina EMS Medical Director Greg Mears, MD.

A study involving EMTs with five volunteer fire departments in rural Ross County, Ohio, convinced the state EMS Medical Oversight Committee to change its rules. (Cotton B, Newland RE, Werman HA: "Transmission of 12-lead ECG tracings by EMT-basics and EMT-intermediates: A feasibility study." *Prehospital Emergency Care.* 12(1):98 [Abstract], 2008.)

"When you get out of urban areas, 70% of EMS is provided by EMT-Bs or -intermediates. Those are the people you really want to do 12-leads because of the long transport times," says Ross County EMS Medical Director Brad Cotton, MD.

"In the emergency room, we can hire someone with no medical background and give them two days of training to apply ECGs," says Robert Newland, EMT-P, EMS Liaison for Adena Regional Medical Center in Chillicothe, Ohio, where emergency physicians receive the EMTs' ECGs and activate the cath lab when appropriate.

EMTs in Dane County, Wis., have performed 12-lead ECGs for nearly three years, according to Dane County EMS Medical Director Paul Stiegler, MD. Dane County has 21 BLS squads (many of them volunteer) and three ALS squads, only one of which (the Madison Fire Department) provides paramedic 12-lead interpretation.

"Some services are 15 to 20 miles from a hospital. We were looking at ways to improve door-to-balloon times, and this was logical," Stiegler says. "We do know we're saving 20 to 25 minutes on average in the county."

The "limiting factor" is transmission, says Keith Wesley, MD, who was the Wisconsin EMS medical director until recently (and is now the Minnesota EMS medical director). "Most programs rely on cell phones, and cellular coverage is extremely spotty in rural areas. [Monitor] manufacturers need to figure out a way to interface with 800-MHz radio systems to transmit the 12-leads." One rural service in Wisconsin and some squads in Ross County solved the problem by buying satellite phones.

But Cotton says, "Sat phones cost about $2,000 a crack with a $50 monthly charge to use the phone." Newland is now trying to raise $300,000 to buy 34 more satellite phones and 13 monitors and upgrade other equipment to outfit 40 EMS squads in Ross County and an adjacent county. "We're also trying to get some state and/or federal funding," Cotton says.

Meanwhile, in the past few months, Dane County has trained—or retrained—some 1,200 EMTs in 23 squads to perform manual defibrillation. "We're now instituting county-wide compression-only CPR (or CCR) and, because we don't want to interrupt chest compressions to use an AED, we've trained all basics to recognize V-fib, V-tach and asystole and ... shock manually," Stiegler says. "The state enabled this many years ago when [it] started defibrillator programs, but then AEDs came along and most EMTs forgot how to do this."

He notes that the EMTs have made some spectacular saves using CCR, including one patient who was neurologically intact after one hour of chest compressions and 43 minutes of shockable rhythms. —**Mannie Garza**

QUICK TAKES

WHEN PRESCRIPTION DRUGS KILL

The Florida Medical Examiners Commission reports that prescription drugs killed three times as many people in Florida in 2007 when compared with deaths caused by all illegal drugs combined. Such strong legal painkillers as Vicodin and OxyContin killed 2,328 Floridians last year; benzodiazepine-based pharmaceuticals (e.g., Valium and Xanax) killed 743; and cocaine, methamphetamines and heroin caused a total of 989 fatalities. According to *The New York Times*, "The report's findings track with similar studies by the federal Drug Enforcement Administration, which has found that roughly 7 million people are abusing legal drugs."

HOT & COLD CONDITIONS DEGRADE MEDS

Eight medications commonly carried in ambulances lose at least 10% of their potency when exposed to extreme temperatures over time. Dustin Gammon, CCEMT-P, of St. John's EMS in Springfield, Mo., led a study in which researchers in the Department of Chemistry at Missouri State University tested the effect of temperature on 23 prehospital medications. (Gammon DL, Su S, Jordan J, et al: "Alteration in prehospital drug concentration after thermal exposure." *American Journal of Emergency Medicine.* 26(5):566–573, 2008.) The researchers reported in June that extreme heat or cold degraded lidocaine, diltiazem, dopamine, nitroglycerin, ipratropium, succinylcholine, haloperidol and naloxone. Do the ambulances you work in carry refrigerators or coolers? For more information, send an e-mail to dustin.gammon@mercy.net.

>> **IN BRIEF:** Bound Tree Medical & Tri-anim Health Services announce merger

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>> JASON J. ZIGMONT, MA, NREMT-P

IT'S NOT JUST A TITLE

The importance of having a 'chief'

The Merriam-Webster dictionary defines "chief" as "the head of a body of persons or an organization" or "something of greatest importance or influence." The public recognizes this title and is familiar with the labels "police chief" and "fire chief." The problem is, when it comes to EMS, the head of the agency is referred to in multiple ways.

A recent poll on JEMS.com found that 37% of EMS organizations call their top officer "chief," 33% "director," 9% "captain," 8% "manager," 7% "president" and 6% other titles.

I bet if a similar poll was completed in the fire service, more than 90% of leaders would be called chiefs, with a couple commissioners here and there. And in police departments, the title "sheriff" would be common, but the majority of leaders would be chiefs.

The title of chief isn't just an issue of semantics. Although titles may not matter much within an organization, they do matter outside of it. If you ask the public who's in charge of an emergency, they will without a doubt say the chief. Some may say this reflects a misunderstanding by the public, but no matter the reason, the title of chief holds a special spot in the public's perception of public safety. This perception may be hurting the 63% of EMS systems that don't have a chief, but we're just not aware of it.

If a police chief, fire chief and EMS director are all at a public meeting asking for funds, the town members may be more likely to listen to the chiefs rather than the EMS director, even though they're all the heads of their respective organizations.

In theory, these public services shouldn't battle; we should all work together. But when it comes to funding, we all have to make the case for our share. A quick look at federal funding reveals dedicated grant sources for fire and police, yet none specifically for EMS. There are a variety of reasons for this, but if we want the respect of the public, we not only have to earn it, but also place ourselves on the same level as fire and police. If all EMS agencies adopted the title of chief for their top leader, we would be one step closer to equality.

PHOTO COURTESY WAYNE ZYGOWICZ

If all EMS agencies adopted the title of chief for their top leader, we would be one step closer to equality.

I know this would cause quite a bit of debate, but if EMS, both volunteer and paid, is to be respected as a profession, our leaders must be respected. This esteem must be earned, but the connotation of "chief" and its inherent attention-drawing qualities would help.

The problem is that the other services we work with often oppose the creation of an EMS chief title. The fact that others fight the title, even though it's a change in name only, is yet another symptom of the problem. This negative reaction is a disservice to our leaders and the communities we serve.

We should also have a similar structure as police and fire, with assistant or deputy chiefs, captains and lieutenants. The responsibility and authority levels are comparable, why aren't the titles? Some communities may consider their EMS agency subordinate to others, but we provide a public service just as fire and police do. Your membership may say titles, badges and uniforms don't matter, but they matter in the public's eyes, and this is just a way for your leader to "stake their claim" and a rightful seat at the head of the table.

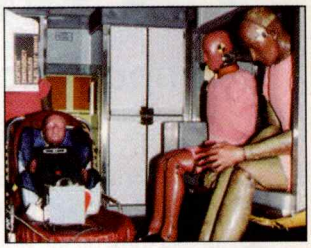
Your applicable state and federal laws or regulations may allow additional legal rights and responsibilities afforded to the chief of a public service agency. Defining these legalities is part of your attorney's job. Your attorney may also tell you that in order to be eligible for these rights and responsibilities, your top leader has to fit the mold, and the title of chief may be part of the requirements.

There's many reasons why a change in title for the top person of your organization would benefit your agency, but the bottom line is that getting there is worth the work. The process will vary by department, but the goal is to change the document that describes your organizational structure. This may require bylaw changes, ratifications by boards or even public hearings, but the short-term pain is worth the long-term gain. The fight isn't only to establish the new title, but to establish the equality of your leader and your agency in the community you serve. Creating and maintaining the position of EMS chief is just one more step toward creating a professional organization and improving EMS as a profession overall. JEMS

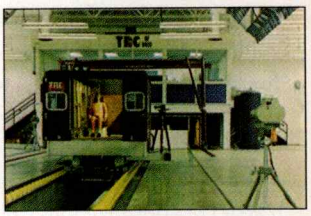
Jason Zigmont, MA, NREMT-P, is an EMS instructor, executive director of the Center for Public Safety Education and the founder of VolunteerFD.org. He's also a PhD candidate in adult learning at the University of Connecticut. Contact him at jason@psecenter.org.

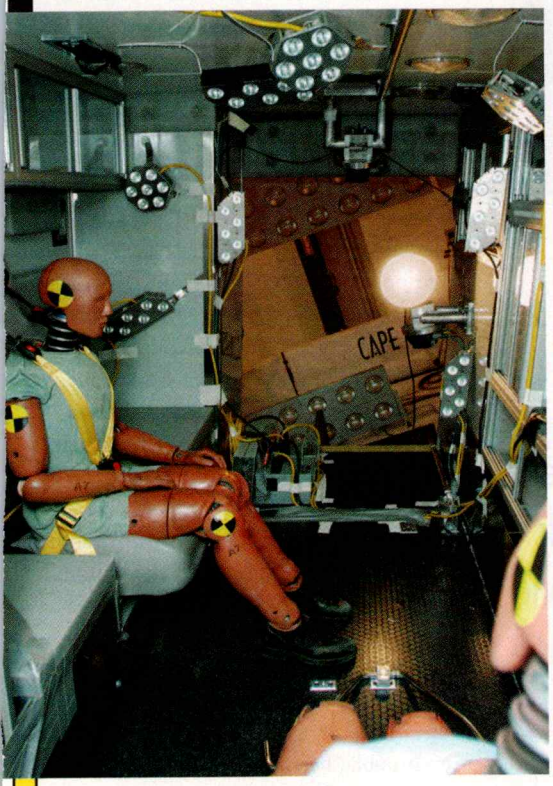
The safety "hotbutton" is like politics: Everyone is jumping on the bandwagon

When manufacturers make quick easy claims about solutions to ambulance occupant safety and crash worthiness, ask to see the data. For without testing there can be no valid discussion about safety. Merely hitting the emotional "hot button" is not enough.



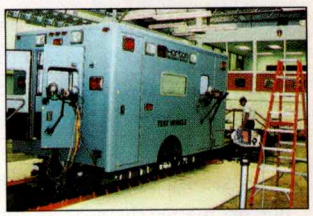
Horton Emergency Vehicles has had on ongoing impact testing program since 1974, starting with Hygee sled tests that provided instrumented testing data covering side, rear and frontal impacts up to 35 G's of force. More recently, the company has added direct impact destructive testing to exceed existing SAE standards on cabin integrity in side and rear impacts as well as rollover protection.





Dropping or stacking bodies and other anecdotal methods have little value when it comes to evaluating mounting systems, structure and patient safety. Flashing lights, cargo nets and other gimmicks do a great injustice to the industry and to your personnel whose lives depend on validated results. The scientific method demands a careful analysis of results and data before making claims of efficacy.

Anecdotal stories of crashes, contrived mock- ups and customer preferences are not enough on which to stake a life. There are no cheap, quick approaches to quality. There are no cheap, quick gimmicks when it comes to safety.



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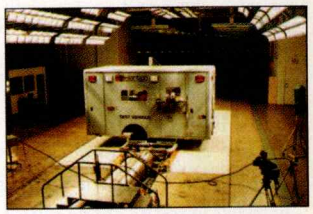

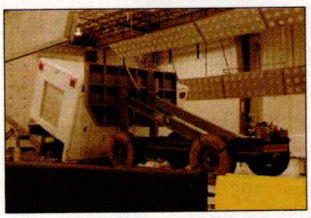

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>> BY GARY LUDWIG, MS, EMT-P

SEEN IT ALL?

Just when you thought nothing could surprise you

A friend who's a fire chief in a West Coast city recently called me, saying, "I thought I had seen it all until ... ." As he started to tell the story, I thought I had heard it before—but not quite like this.

A battalion chief had come into the chief's office, also saying, "I thought I had seen it all until ... ." One of his firefighters claimed another crew member was posing nude on a match-making Web site and that everybody who solicited dates on the site was fully nude in their pictures. When the chief officer asked how he knew about it, the firefighter was quick to dispel the suspicion he was searching porn sites, explaining that he had heard about it from a nurse at a receiving hospital and then checked the site. The firefighter reporting this claim had also told others, and the rumor set off alarm bells throughout the station and the entire department.

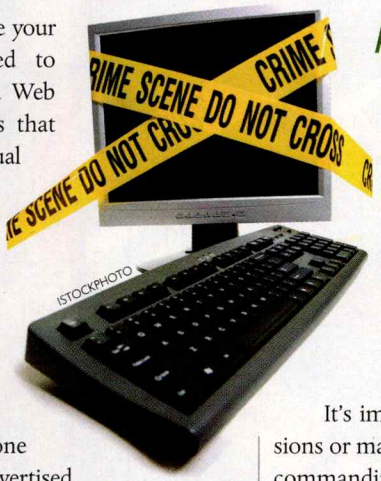
The battalion chief reported the claim to the fire chief, who, along with the battalion chief, visited the alleged porn site and confirmed the rumor.

How have I heard about this before? Several years ago, a volunteer fire chief in Florida posted pictures of himself on a dating Web site, wearing a uniform shirt but nothing from the waist down. The fire chief who oversaw all the volunteer fire departments in the county brought the involved fire chief up on charges under the auspices of rules and regulations of the county fire department.

Facing disciplinary action, the volunteer fire chief resigned. Five months later, he was back with the department but with the new title of president and (self-dubbed) "administrative chief." The county fire chief issued a "cease and desist" letter to him, but he refused, saying posting photos of himself was not illegal and, in his opinion, not immoral.

EXPECT IT

These cases are clear examples of the challenges EMS managers can face when they think they've "seen it all." Presented with this kind of scenario, many questions naturally come to mind: Are your employees entitled to solicit mates via a Web site? Do the facts that the Web site is sexual in nature and users are nude change the equation? What if they had posted their profile on a more conventional match-making Web site, like one that's regularly advertised on TV? Would your response be different?



Are your employees entitled to solicit mates via the Internet—including on Web sites where everyone is nude?

Answering these questions helps you separate your own morality from the ethical standards set by your agency. With each possibility considered, you can move forward to address the situation.

First, you have to consider whether an employee violated any rules or regulations by participating on a match-making site. Possibly, your agency has a rule that an employee's conduct shall not be unbecoming on or off duty. Other "catch-all" organizational rules I've seen stipulate an employee is to always maintain the public confidence by their actions on and off the job. If you have these rules, you must determine if participating on a match-making site that allows nudity is "unbecoming" or jeopardizes the confidence of the public.

But what if your organization has no rules governing an employee's actions off the job? Can you even consider any charges against the employees?

One of your first actions should be to get written statements from the employees involved. These statements are necessary parts of the investigative process. You should also speak with your agency or city attorney, who can advise whether any department rules or regulations have been violated.

It's important not to jump to conclusions or make a quick judgment. You're not commanding a multi-casualty event that requires split-second decision-making; you have discretionary time. Use that time and make sure you have all the facts before making a decision.

CONCLUSION

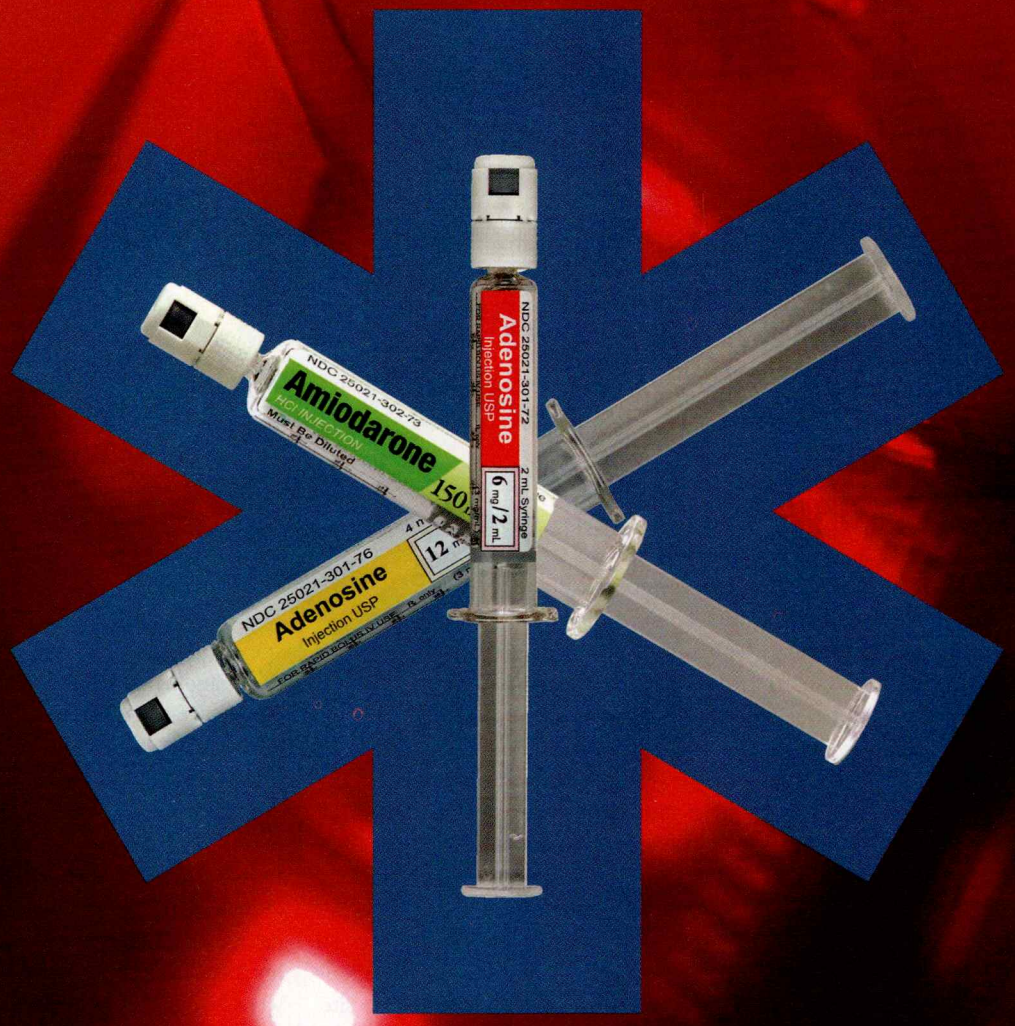
In the case of the firefighter who was advertising himself on a pornographic Web site, his department determined his actions were "unbecoming" and took disciplinary action against him. The other department that reinstated the fire chief was eventually decertified as a county response entity (with no reported connection to the fire chief's conduct).

Both cases highlight the need for a careful balance between the rights of your employees and the rules of your organization. Thoughtful decision-making with legal counsel will help you render a fair decision.

Nothing seems to surprise me anymore, and I'm cautious to say, "I thought I had seen it all until ... ." Whenever you get to that point, it seems something else happens that will amaze you. JEMS

Gary Ludwig, MS, EMT-P, is a deputy fire chief with the Memphis (Tenn.) Fire Department. He has a total of 30 years of fire and rescue experience. He's chair of the EMS Section for the International Association of Fire Chiefs and can be reached at www.garyludwig.com.

One less step when time matters



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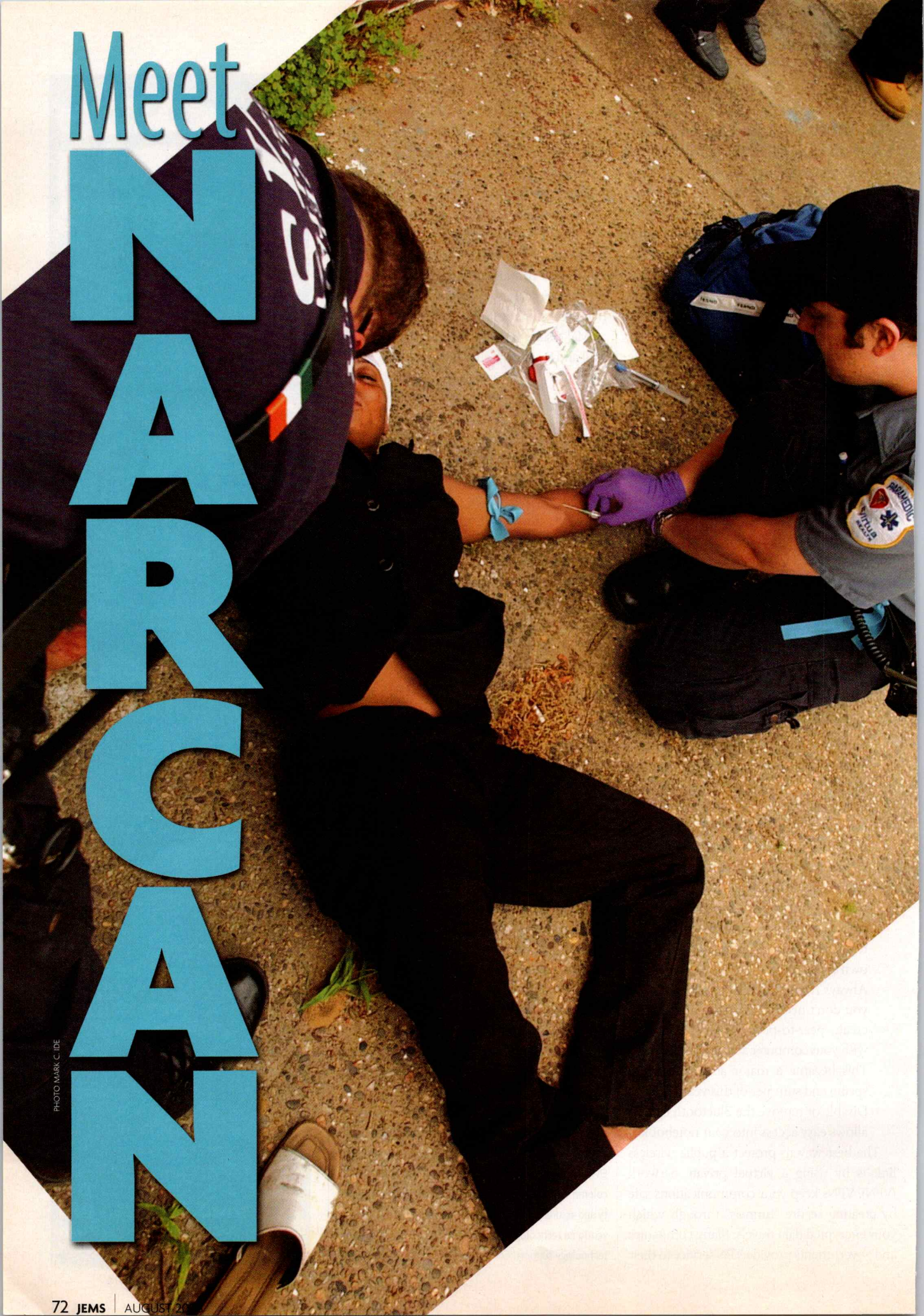

PHOTO MARK C. IDE

In densely populated areas, many networks can be visible when a Wi-Fi card is turned on. (I heard that someone in Las Vegas actually recorded 199 separate networks available to his PC.) If you don't control your Wi-Fi settings and you're running Windows, your notebook will frequently try to make itself "at home" on other people's networks.

At public Wi-Fi locations, the station and any other locations, it's important to properly secure your wireless connection. It's easy for others to watch your wireless traffic and computing activities, almost in real time. It's also relatively easy for hackers to hijack your session and take over your account. If you were logged in to an online banking session, they could easily obtain your financial records.

Read More ...
"10 Notebook Security Tips"
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Because public hot spots generally don't use encryption, you should assume that anyone can see your Internet traffic, unless you take the following precautions:

- Make sure you're using a legitimate hot spot: Nefarious types have been known to set up pirate routers with a familiar service set identifier (SSID) name for the wireless network, such as "wayport" or "T-mobile," and then use it to capture users' login information and other data.
- Verify that your PC's software firewall is turned on and the Windows file-sharing feature is off.
- Never send bank passwords, credit card numbers, confidential e-mails or other sensitive data online, unless you're on a secure site. Look for the lock icon in the bottom-right corner of your browser, as well as a URL in the address bar that begins with *https*. Such sites build in their own encryption.
- Always turn your Wi-Fi radio off when you don't need it. Hackers can use it to create peer-to-peer Wi-Fi connections with your computer and access it directly. This became a major attack vector in spring and summer of this year.
- Disable or remove the Bluetooth card. It allows easy access into your notebook.

The best way to protect a public wireless link is by using a virtual private network (VPN). VPNs keep your communications safe by creating secure "tunnels" through which your encrypted data travels. Many companies and governments provide VPN service to their mobile and offsite workers, so check with your IT department to see if this is available.

An inexpensive VPN service that offers a number of options is HotSpotVPN. This allows you to create a secure tunnel to HotSpotVPN's servers where you're placed on the Internet. All traffic from your PC to the Internet is contained within the tunnel, so the hacker can see only encrypted traffic from you and nothing sensitive is exposed.

Make sure you're behind a hardware firewall and a network address translation (NAT) type of routing device. This simple step costs as little as $35 and can protect you from a myriad of online criminal activities.

Also, keep the software firewall of your PC on, even when behind a hardware firewall. If an infected notebook enters the office and connects to the network and certain PCs don't have their software firewalls in place (assuming there's no other threat-management appliance in place on the local area network), a worm will spread to all of the other PCs. A software firewall is especially important for nomadic PC notebooks.

JUST LIKE CASH

The best advice for keeping your notebook computer around is to treat it like a $500 bill. Would you leave it on a restaurant table while you chat with friends? How about in a hotel room? If you have notebook computers deployed on EMS units, try to have your personnel apply the same logic. Never let the $500 bill out of sight.

There isn't a perfect solution yet for notebook security. As the trusted computing initiative moves along, the hardware will become less attractive to thieves looking for a quick buck. However, data will remain attractive for all the same reasons: identity theft, espionage, intelligence, competitive advantage, blackmail, bribery and so on. It'll always be a challenge to keep data secure, and the insider will always be the highest threat. JEMS

William Ott is chief consultant at CPCS Technologies and co-founder and chief technologist at Max-Q Media, both located in Cary, N.C. He spent 20 years as a paramedic and EMS educator and also developed and wrote the eJEMS column. Since 1998, he has focused on information security and assurance, secure wireless communications, unconventional technology development and counter-terrorism technology support. Contact him at weo@cpcstech.com.

>> CONTINUED FROM PAGE 73

Drugs Narcan Will Block
Ambenyl
Anapolon
Anexsia
Astramorph
Bancap HC
Codalan
codeine
Co-Gesic
Compal
Damacet-P
Darvocet
Darvon
Demerol
Diagesic
dihydrocodeine
Dilaudid
Dolophine
Duragesic
Duramorph
Endocet
fentanyl
heroin
Hycodan
hydrocodone
hydromorphone
levofloxacin
Lomotil
Lonox
Lortab
Mepergan
meperidine
methadone
morphine sulfate
MS Contin
Norco
Nucofed
Numorphan
opium
Orlaam
oxycodone
OxyContin
oxymorphone
Percocet
Percodan
Pethadol
propoxyphene
Roxanol
Roxidcet
Roxidcodone
Sublimaze
Tussend
Tussionex
Tylenol #2, #3, #4
Tylox
Vicodin

Common Drugs Narcan Will Have No Effect On
alcohol
Ambien
cocaine
ecstasy
marijuana
methamphetamine
muscle relaxants
Rohypnol
sedatives
sleeping pills
Valium
Xanax

tanyl. OxyContin produces opiate-like effects and is frequently used as a substitute for heroin. Most individuals who abuse this drug do so to gain euphoric effects. Because OxyContin is a time-release tablet, users often chew, snort or inject it to accelerate its effects and get an instant and intense high.

Another drug that has hit the streets is fentanyl. Fentanyl is cheaper than heroin and 80–100 times more potent than morphine, which make it an appealing drug to abuse. It can lead to respiratory failure so quickly that patients die before they even finish shooting up. Reports of people chewing or eating fentanyl patches have been surfacing for several years.

Use of heroin laced with fentanyl has grown this year in larger U.S. cities, resulting in hundreds of EMS calls. Fentanyl amplifies the potency of heroin, and the combination can kill because it severely depresses the respiratory system and central nervous system (CNS). It may not be obvious to drug users when heroin has been laced with fentanyl.

EMS crews are also being called to treat people abusing codeine, Darvocet, Tussionex, Talwin, Endocet, Norco, and the list goes on and on. It's important that you know the symptoms of these overdoses (see Figure 1, p. 75), because your service will probably experience an increase in narcotic overdoses soon enough (if it hasn't already).

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THE OPIATE HIGH

In U.S. law, the term "narcotic" refers to opium, opium derivatives, and their semisynthetic or fully synthetic substitutes, as well as cocaine. Opiates are powerful drugs that have been used for centuries to relieve pain. They're derived from the seed of the opium poppy plant, which is appropriately nicknamed the "flower of joy." Approximately 20 different alkaloids are derived from opiate powder, including heroin, morphine and codeine.

Other drugs, termed opioids, are synthetic drugs. These drugs aren't derivatives of opium, but they have pharmacological properties similar to opiates. Some of the most popular and highly abused opioids for pain management include fentanyl, oxycodone and OxyContin.

Your body makes its own supply of opiates, called endorphins. As the body's internal pain regulators, endorphins bind to opiate receptor sites, thereby blocking pain. They're released immediately following an injury and can provide enough pain relief to allow a person to escape from a harmful situation. When the threat of danger or harm has passed, endorphin levels decrease and intense pain may return. (If endorphin levels remained high and continued to blunt the pain, a person might not take notice of an injury and fail to seek medical care.)

Endorphins have another interesting twist. If you're one of those people who can't resist the lure of chocolate or donuts, you're an addict, laid low by food's ability to produce

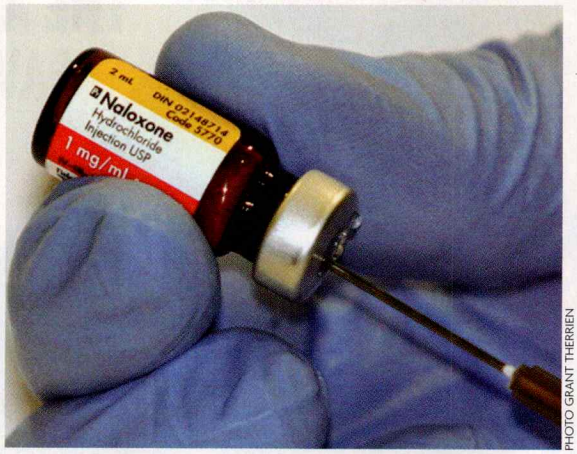

PHOTO GRANT THERRIEN

Narcan is shorter acting than most of the drugs it reverses. You may need to administer Narcan repeatedly to get your patient through the overdose.

opium-like chemical responses in the brain. When ingested, chocolate and other high-sugar foods typically trigger feelings of pleasure through a domino effect: You taste food, it sends a nerve impulse to the brain that triggers the opiate domino, and the opiate domino triggers the dopamine domino, which in turn makes you feel good. In one study, Narcan was given to subjects, and this pleasure response to foods was blocked.[2] This is because Narcan is classified as an opioid antagonist, which means it'll competitively seek out, and ultimately block, the opioid receptor sites in the CNS.

That study illustrates how opioids attach to specific proteins called "opioid receptors," found in the brain, spinal cord and gastrointestinal tract. These opiate receptors are crucial to how the body perceives and responds to pain or pleasure. In trauma, injury or illness, specialized nerves carry a pain message to the spinal cord where it's relayed to other neurons, some of which carry the message to the brain. When opiates bind to the receptor sites along the spinal cord, they interfere with the transmission of the pain message between neurons and prevent the pain message from reaching the brain.

Opiates also bind to receptor sites in the brain, which affect how a person experiences and perceives pain. Opiates don't make the pain go away; they change the person's subjective experience of pain. This explains why patients receiving morphine may say they still have pain, but that the pain just doesn't bother them anymore.

When opiates are used by someone who's not experiencing pain, the drugs induce euphoria by affecting regions of the brain that control pleasure. The intense rush is brief and followed by a few hours of a relaxed, content state. Many users enjoy this feeling so much, they seek to experience it repeatedly, making it an addiction. In a negative and potentially lethal side effect, opiates act directly on the respiratory center in the brainstem, which can lead to a depressed respiratory rate or loss of respiratory effort altogether, resulting in complete respiratory arrest and ultimately death. That's where Narcan comes in.

THE AMAZING DRUG THAT HELPS SAVE OVERDOSE PATIENTS

>> BY KAREN BARKER, RN, CCRN, EMT-P, & DON HUNJADI, EMT-I

They wake the unconscious, cure the very ill and even rescue patients from death's door. They're miracle drugs, and thousands of ambulance services across the country carry them. For those onlookers and new EMS providers who see a patient wake up from a deep, unconscious state, it's a captivating experience. The most common of these drugs is dextrose. But there's another—Meet Narcan.

ANOTHER LIFE SAVED

There had to be a crowd of more than 100 teenagers staring as the ambulance crew came into the dance club to treat an unconscious 17-year-old patient who was reported as turning blue. "Honestly, I swear, none of us has had anything to drink," said the patient's best friend. "We got here about an hour ago. Jeremy said he wasn't feeling good, then he started getting sleepy and slumped down right here."

Jeremy was clearly in trouble. The EMS crew immediately sprang into action and managed his airway by inserting an oral airway with surprisingly little resistance. As one of the EMTs ventilated Jeremy with a bag-valve mask, others helped a paramedic hook up the heart monitor, start an IV and check his blood sugar. "Should we drop an ET tube?" asked one of the providers. "Let's just see if we can correct whatever the problem is first," replied the team leader.

One of Jeremy's friends said he thought Jeremy was diabetic. This could have played a role in Jeremy's condition, but what would account for the respiratory depression? "Blood sugar is 108," shouted one of the EMTs. "I've got an IV here. Someone hand me the tubing," said another. "Someone check his eyes for me," instructed the team leader. "Pinpoint and non-reactive," came the reply. "Let's go ahead with a couple milligrams of Narcan. If that doesn't do anything, we'll consider intubation and then get going," said the team leader.

In less than 60 seconds following Narcan administration, Jeremy's respirations were greater than 20, and he was starting to react to the oral airway. Not long after that, he was sitting up and talking with the crew. Jeremy's best friend turned to the team leader and said, "You guys rock! You saved his life. The way he went from almost dead to talking was a miracle!" The team leader calmly turned and said, "Nah, it's just Narcan."

What Jeremy's best friend didn't tell the crew was that they'd been buying OxyContin at the club. This was the fourth time they'd done it. But this time it almost cost Jeremy his life.

For $20, a guy in the parking lot would sell each of them a little pill that they would crush up and swallow. The problem was that Jeremy didn't know OxyContin comes in different doses. The dealer had been selling them 20-mg pills but accidentally gave Jeremy an 80-mg pill this time—four times his previous dose and the equivalent of 16 Percocets.

NARCOTIC USE TODAY

Since the mid-'90s, narcotic overdoses have been on the rise throughout the country. Ambulance services that might have only seen a couple of narcotic overdoses each year in the 1980s are now seeing dozens, and in some cases hundreds, a year.

Heroin has made quite a comeback, and drugs, such as oxycodone, hydrocodone, fentanyl and OxyContin, are commonly prescribed. As the population ages, and as medical professionals see the importance of appropriately managing a patient's pain, drug companies are producing and selling narcotics in record numbers.

Studies show that teenagers have increased their abuse of narcotics (other than heroin) by more than 300% in the past 10 years. A 2005 study found that nearly one in five (19% or 4.5 million) teens have tried prescription medication (pain relievers such as Vicodin and OxyContin; stimulants like Ritalin and Adderall) to get high.[1]

A portion of this population overdoses. Narcotic overdoses are caused by a wide variety of drugs, including OxyContin and fen-

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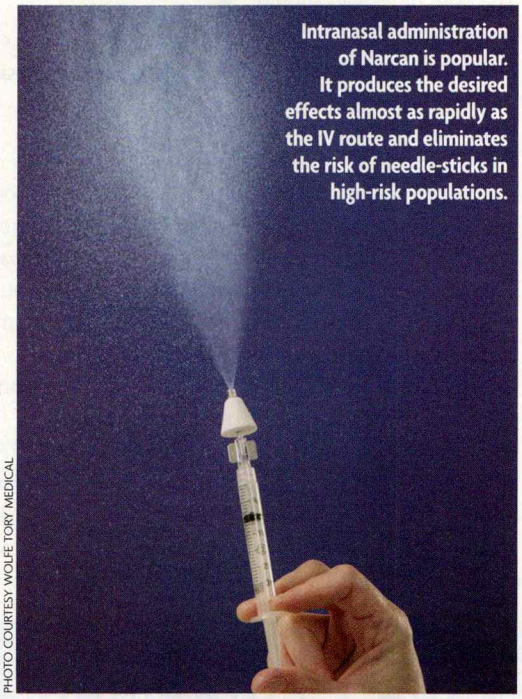
should be administered via an intramuscular (IM) or intravenous (IV) route. Administering Narcan IV provides the quickest action (within one to two minutes). When administered IM, the desired effects are usually seen within two to three minutes. Narcan can also be administered via the intraosseous route in an unconscious patient and result in quick action, similar to when administered IV.

The route of administration should be individualized for the patient. In order for Narcan to work, it has to get to the receptor sites along the spinal cord and in the brain. If a patient has been down any period of time, IV access may be difficult, making IM administration seem like the faster, easier route. However, when the patient has a prolonged downtime, blood supply is shunted from the muscles, dramatically decreasing absorption of the drug. Without proper management of the ABCs—especially circulation—the IM dose of Narcan could sit in that muscle indefinitely.

Intranasal administration is gaining popularity because Narcan can be atomized, it's absorbed easily across nasal mucosa and a needle isn't required. Drug abusers who require Narcan therapy comprise an especially high-risk patient population due to their increased risk of carrying HIV or hepatitis B and C.

Attaching an atomization device, such as the MAD (Mucosal Atomization Device) (see photo), to the syringe instead of a needle can reduce the number of needle sticks involving this high-risk population. The atomizer is placed in the patient's nostril and fine particle atoms of the administered drug are absorbed across the mucosal membranes. This route of administration produces the desired effects almost as rapidly as the IV route without the needle-stick risk.



Intranasal administration of Narcan is popular. It produces the desired effects almost as rapidly as the IV route and eliminates the risk of needle-sticks in high-risk populations.

PHOTO COURTESY WOLFE TORY MEDICAL

FEW SIDE EFFECTS

Narcan is an extremely safe drug, with few reported side effects. However, you must still proceed with caution when using Narcan; it can provoke an acute withdrawal syndrome if the patient is addicted to narcotics. In addition, when giving Narcan to a comatose patient, take extra care to recognize and guard against aspiration, as vomiting may occur before the patient is completely alert.

Acidotic blood and tissues caused by hypoventilation or cessation of breathing for a period of time can cause non-cardiogenic pulmonary edema, in which the membranes in the lungs become porous and allow the blood serum to move from the capillary beds into the air spaces of the lungs. Repeated use of Narcan can be fatal in these patients.

Violent and aggressive behavior following Narcan administration is uncommon but possible. Behavioral outbursts are most often related to confusion, sudden awakening, immediate narcotic withdrawal or the actions of other concomitantly ingested drugs now unopposed by the narcotic effect. This is a terrifying situation for the patient, not to mention the EMS provider. Be on guard.

CONCLUSION

In a case that emergency department staff referred to as "the case of the fentanyl twins," a 41-year-old male ended up on a ventilator after he chewed a fentanyl patch. His friend did the same thing but didn't say a word to the EMS crew on scene. In fact, he watched as the crew intubated his near-death friend and whisked him away. Shortly after the ambulance returned to its station, a second call came in from the same address for the exact same problem. You can guess who that patient was.

More than likely, an overdose patient's friends know what has been taken, but that doesn't mean they'll tell you. Even as their unresponsive buddy is being carried away on a stretcher, they may still not say anything—even if they've ingested the same drug—for fear of criminal actions against them.

Many long-time ALS providers may remember that during their initial training they were told it would be rare to encounter a true narcotic overdose requiring Narcan. Many went on to find this statement to be true. But not anymore. The number of times Narcan is indicated, and more importantly, has a positive impact on the patient's condition, has gone from once or twice a year to perhaps dozens in most EMS systems, depending on call volume and service location.

Just as a diabetic patient should never be delivered to the hospital with undetected hypoglycemia, a narcotic overdose should never be delivered undetected. How aggressively you treat an overdose patient will be driven by a variety of indicators, including level of consciousness, respiratory rate and quality, pulse ox and end-tidal readings, as well as the patient's overall presentation.

When Narcan is administered appropriately, you might have onlookers claiming they've just witnessed a miracle. Of course, you'll know it's just Narcan. JEMS

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NARCAN BASICS

With the changing curriculum and EMTs in some states being authorized to perform additional skills and administer a wider variety of medications, more ambulance services are carrying Narcan than ever before. But do EMS providers use it effectively? Are some overdose cases slipping by undetected or underdosed?

The most commonly used concentrations of Narcan in the prehospital setting are 0.02 mg/mL, 0.4 mg/mL and 1 mg/mL. Many systems now allow their providers to start with 0.4 mg and increase the concentration until they reverse the effects of the narcotics, such as respiratory and CNS depression and hypotension.

Standing orders don't typically prescribe a tailored approach to each patient's problem when it comes to an overdose. The orders are often plain and simple: Administer Narcan 2 mg IV. If there's no response, repeat the initial dose every two minutes, up to a total of 10 mg. But the response of your patients can be vastly different.

A good rule of thumb is to start with a small dosage and work your way up, allowing the patient to become conscious enough to breathe on their own. It's not always beneficial to fully awaken an overdosed patient, especially one who's a known abuser. The dose of Narcan should be individualized for the patient whenever possible.

It's imperative to understand that Narcan doesn't cure the overdose. It just temporarily prevents the drugs from having an effect on the body and restores enough consciousness for the patient to breathe on their own—part of an organized approach to resuscitating a patient who's suffering from an overdose.

Resuscitation occurs in a prioritized order; no aspect of care should be overlooked in favor of another. Emergency treatment must evolve from basic to advanced, and resuscitation should not be concentrated on the administration of Narcan until airway, breathing and circulation are secured.

Figure 1: Symptoms of a Narcotic Overdose

- Pinpoint pupils
- Respiratory depression
- Confusion
- Drowsiness
- Mood changes
- Clouding of mental function
- Apathy
- Cool, clammy skin
- Weakness
- Loss of consciousness

Also keep in mind that Narcan is shorter acting than most of the drugs it reverses. Therefore, your patient may slip back into an unconscious state. You may need to administer Narcan repeatedly to get the patient through the overdose.

With the increasing number of narcotics being abused concomitantly with other drugs, Narcan may also be a diagnostic tool for the unconscious patient of unknown etiology. If there are no opioids in the patient's system, Narcan will constrict the pupils. If the patient has opioids in their system, Narcan will cause the pupils to dilate. In the absence of narcotics, it exhibits essentially no pharmacologic activity.

ROUTES OF ADMINISTRATION

Narcan is supplied as an injection solution in various concentrations. In a patient with a known or suspected narcotic overdose, it