Will Arizona be ready?

Preparing for a Disaster

Maximum casualties

Preparing your office for an infectious disease emergency

The role of amateur radio in disasters

PLUS...

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It ain’t brain surgery

I have three tails or how one visit can wreck a career
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Spring 2006
Hurricane Katrina shook our nation—literally in the Gulf Coast region—and glaringly pointed out just how unprepared our nation is for a disaster. Many days after the winds, rain and floods devastated thousands of miles of coastal land, victims began to be relocated to nearby states, including Arizona, where volunteers waited with open arms.

Among those volunteers were hundreds of our state’s physicians, who responded to a call for help from the Arizona Medical Association. Utilizing a special web site, that was hastily pulled together, doctors from all over Arizona signed on to do what they could for those displaced Louisianans and Mississippians that were headed our way.

But, the doctors’ phones never rang. Their pagers never buzzed. In Tucson, doctors were actually turned away when they arrived at the convention center, offering their services. As it turns out, the state and counties decided they didn’t need them. The victims arriving here, for the most part, weren’t in need of ongoing medical care. They were triaged by the few health care providers they obtained from area hospitals. Ultimately, the greatest need was to find them temporary housing, which was found.

So, we dodged a bullet. The need was not great. Yet, even though the process ran smoothly, it was hard to know who was in charge. In Phoenix, the Arizona Department of Health Services worked with local area hospitals to comprise medical teams to treat evacuees. In Tucson, it was the Pima County Health Department.

The message to the medical community from all of this was clear—we’ve got this under control. We’ll call you if we need you. But, the reality is this was really small potatoes. The total number of evacuees who came here didn’t even total 1,000. And, state officials had days, if not weeks, to prepare for this small onslaught of minimally injured victims.

The obvious question is, are we, in Arizona, really ready? Since 9/11, the ad hoc Public Health Committee of the Arizona Medical Association has grappled with that very question and what the role of the in-the-trenches physician will be. We’ve had countless presentations and discussions with state officials about this topic, but still are unclear about what plans are in place and what everyone’s role will be.

No one denies the fact that when, not if, a disaster occurs, many, many people will be calling their doctors or showing up at their offices, wondering what to do. And, what will we tell them? What is the plan?

Sooner, not later, this needs to be clearly defined. The ad hoc Public Health Committee will continue to hammer away at this issue until we get some answers. See some plans. Know our role.

We will be ready. And, I know we will be needed.

Dr. Ditmanson is an internist practicing in Tucson. He is president of the Arizona Medical Association.
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The intention of terrorists is to produce maximum casualties and maximum terror and disruption. The result – intended or not – of complacency, ignorance, and lack of preparedness is to help terrorists succeed.

Since 2001, we have had a massive bureaucracy called the Department of Homeland Security; billions of earmarked expenditures; and possibly some improvements in our ability to respond to natural disasters and epidemics. But in many ways, our ability to survive the really big threats has deteriorated. We have a long way to go to reach the capacity we had in the 1960s. Fortunately, it is possible to prepare ourselves, virtually overnight, to save millions—if we have the will to do so.

Pima County Medical Society Executive Director Steve Nash provides some historical background on the vanishing role of physicians, especially office-based physicians, in the emergency response system. Former Virginia Governor James Gilmore gives a national perspective on preparedness. Dr. Vincent Fulginiti details local efforts to form volunteer Medical Reserve Corps to augment the capacity of professional responders. One big obstacle they have partially overcome is tort liability. Terrorists provide the explosives, and the plaintiff’s bar and our own courts put a roadblock between victims and potential rescuers.

The really big threats that could destroy our civilization include bioterrorism or pandemic disease; an electromagnetic pulse that shuts down the electric grid and destroys essential electronic infrastructure; and the use of radiologic dispersal devices (“dirty bombs”) or nuclear weapons. Modern technology has magnified the biologic threat—with air travel, more world trade, just-in-time inventories of essential supplies, and bioengineering. Much of the national preparedness thrust is directed toward improving vaccine production and stockpiling drugs. But the private doctor is basically left with Infection Control 101, as outlined by Dr. Peter Kelly.

Computers and the Internet place the world’s knowledge resources at our fingertips—providing that they work. Even if the power is on, the Internet does not have infinite capacity. If hundreds of millions try to access information all at once, the system could freeze. The most robust form of communication is still radio. Joe Thompson writes about the indispensable role of the ham radio operators. ArMA Past President Dr. Earl Baker recognizes the importance of having a battery-powered or mechanically powered radio. You should protect one by wrapping it in insulating material and putting it in a metal container (a Faraday cage). But Tucson radio transmitters are not EMP hardened. Do you have a short-wave radio or a line-of-sight ham radio?

In the 1980s, Federal Emergency Management Agency (FEMA) Director Julius Becton remarked that “all hazards” preparedness had come to mean “all hazards but one.” The United States is still in a massive state of denial about the possible use of one or more nuclear weapons on American soil, despite the chilling news from Iran, North Korea, Pakistan, and other places. General Becton made a valiant effort to revive civil defense. But in the 1990s, FEMA’s Office of Civil Defense was eliminated, the nationwide radiologic monitoring system was discontinued,
and states were ordered to dispose of the instruments that had been maintained and calibrated for decades, as engineer Philip Smith explains in his primer on radiologic monitoring.

The US government “plan” for dealing with nuclear disaster is to whisk important government officials off to hardened bunkers and tell the public that “you’re on your own.” Radio is now running PSAs that feature childish voices asking about the family plan, such as “Should I go to the neighbors’ if you’re not home?” So far, I’ve heard nothing about what to do if you see a bright flash. My nephew’s wife, who was raised in Beijing, was taught to take cover immediately. How about your children?

The Department of Homeland Security is telling people that they need to be able to take care of themselves for 72 hours. If the emergency is another Hurricane Rita, FEMA can probably send in a truck with bottled water by then. But what if five cities have been hit with a nuclear weapon and FEMA has been obliterated?

Most Americans are terrified of any dose of radiation, however tiny, thanks to decades of hysteria mongering. They don’t even know that it is very easily measured. Firefighter Bob Thompson writes of the path-breaking program of Rural/Metro Fire Department to protect its personnel as well as the people they serve, deploying equipment that Smith developed, and setting standards appropriate to a wartime environment. And, Dr. Baker is setting an example for private physicians to follow too.

The situation is not hopeless. Dedicated—and prescient—government scientists and engineers at Oak Ridge National Laboratory concluded in the 1950s that the federal government was not going to undertake a serious program of civil defense like that in Russia, Switzerland, Singapore, or China. Maybe the decision-makers wanted to keep Americans hostage to the Mutual Assured Destruction ideology. Maybe they just thought the issue was a loser in the opinion polls. But the government did fund the work on expedient civil defense. We could use that knowledge to save millions of lives even in the worst-case nuclear attack scenario.

It would not be a high-tech program. NukAlerts are ingenious devices, and they should be as common as smoke detectors. But few of them exist now, compared with the need, and they can’t be manufactured without months of lead-time. However, an adequate instrument can be made in a few hours. Thousands have already done it.

Rural/Metro Fire Department has one of these Kearny Fallout Meters (KFMs) sealed in a paint can to keep it dry. You should have one too. If you don’t have a schoolchild to make you one, you can order a kit, or a ready-made KFM. The prices are high—partly to encourage you to learn to make it yourself.

Then you need to know what to do with the reading. Depending on the dose-rate, you should either avoid panic and continue doing your job—or take immediate action to leave the area or shield yourself.

Of course, the official public shelter program was also discontinued, but Kearny and coworkers provide expedient sheltering advice, along with instructions for making a KFM and information about nuclear weapons effects. The “core shelter” could be constructed almost anywhere on short notice. It is shown in the civil defense DVDs produced by the Oregon Institute of Science and Medicine, starring the late Cresson Kearny himself and volunteers. Kearny’s book Nuclear War Survival Skills is the bible on expedient, all-hazards civil defense, which FEMA once distributed to thousands of state and local emergency managers. NWSS covers the whole gamut of survival needs, including ventilation, water purification and storage, food storage, and hygiene; it is not a dumbed-down duct-tape-and-plastic poster. All directions have been carefully field tested with ordinary Americans. Download it now, while the Internet is up, and order a hard copy.

All physicians—all Americans actually—need a basic insurance policy against the really big threats: some knowledge, a radiation meter, an EMP-protected radio, a copy of NWSS, and some basic supplies. Our government has developed the knowledge (and apparently has forgotten it)—and left us on our own.

If we don’t prepare ourselves to confront the threat, are we collaborating with the terrorist objective: maximum casualties?

Resources:
www.physiciansforcivildefense.org (includes the core shelter video and a link to download NWSS)
www.nukalertnow.com (has a demo of how the NukAlert works and a photo of Rural/Metro firefighters)
www.nitro-pak.com (one source for ready-made KFMs)
http://oism.org/nwss/s73p1467.htm (order NWSS and/or a complete set of DVDs)

Dr. Orient is an internist. She is a Southern District Director of ArMA, chairman of the Public Health Committee of the Pima County Medical Society, member of the ArMA ad hoc Public Health Committee, and founder of Physicians for Civil Defense. She formerly lectured at the National Emergency Training Center in Emmitsburg, MD.
Do we face, post-9/11, an absolute further threat from terrorist nuclear, biological and chemical warfare? Senator Sam Nunn, Ted Turner and famed stock broker guru Warren Buffet have funded a “Nuclear Threat Initiative,” which adds major private funds to aid government agencies such as the International Atomic Energy Agency. They have also produced a documentary film, “Last Best Chance,” available gratis via www.nti.org/donate or (800) 336-0035. Thus, highly respected, patriotic individuals have rallied to avert a “not an ‘if’ but a ‘when’” disaster. How should Arizona physicians so partner? First, for self and family, secure a 7-14 day shelter area (concrete when available) and store liquids, foods and antibiotics such as tetracycline and Cipro (which, according to the armed forces, has a 10-year shelf life), along with blankets, waste disposal items, and other essentials. Second, physicians need access to communication ability—secure a Grundig or other “wind up” (not battery dependant) short-wave radio (cost, less than $100), since all other non-wireless communication is likely to be ineffective. Third, provide for protection against radioactive fallout from either a “dirty bomb” or even a nuclear explosion. Both acute and chronic radiation health effects are covered in an excellent review in the Journal of American College of Surgeons (January 2006, pp. 144-155). Physicians need to be able to measure radiation levels with a device such as a NukAlert radiation monitor/alarm, a small device that can fit on a key chain. The NukAlert, which is “on” 24/7, emits a chirping sound when exposed to high radiation levels from 0.1 to >50 R/hr. The NukAlert has a 10-year battery life. It is available from www.nukalert.com or (830) 672-8734, for $160 (with discounts for bulk orders). For fallout from nuclear weapons, “for every seven-fold increase in time after radiation detonation the exposure rate decreases by a factor of 10.” Measurement of time passage and dose intensity will facilitate decisions about emerging from shelter. Education about bioterrorism—the “poor man’s atomic bomb”—is crucial. Anthrax is highly contagious, and spores are temperature resistant. The Arizona Medical Association ad hoc Public Health Committee has produced an outline that should be posted in all office and hospital locations. (See insert, “Key Resources—Bioterrorism”). Finally, physicians need to be involved in community efforts. The
Arizona Medical Association, at the June 2005 House of Delegates meeting, authorized partnership with the Arizona Department of Health Services and involved specialties. ArMA’s ad hoc Public Health Committee has initiated such an approach, but the major difficulty remains the lack of a statewide, coordinated, topographic-specific written plan to establish chain of command, physician responsibility, use of manpower, area assignment, etc. The Arizona hospitals, police, and fire departments have a comparable program but, except for Pima County Medical Society, with the efforts of Drs. Bill Carrell and Vincent Fulginiti and Executive Director Steve Nash, other physician participation statewide has been minimal.

The New Mexico legislature has mandated a four to eight hour course on nuclear, biological, and chemical warfare for all physicians seeking license renewal. This is facilitated by a certified CD-ROM program, allowing for home or office study.

On the positive side, the federally funded Maricopa Medical Physician Reserve Core is a volunteer physician-directed, disaster education program administered by the Department of Health and Human Services and is scheduled to initiate classes in early February 2006 at Banner Hospital. Contact Richard Thomas, richardthomas@banner-health.com, 602-616-2327. This program is geared toward both terrorism and other year-round disaster occurrence. It has a potential use for other state areas and thus partnership with the Arizona Medical Association.

In conclusion, individual physicians should establish a first-responder kit with a radiation monitor and radio; prepare and stock the best possible shelter area; and participate in disaster self education including actual on-site exercises. The Arizona Medical Association must implement an advisory committee including multiple specialties such as emergency and orthopedic physicians and partner with the state and county health departments to establish a statewide written disaster response plan.

Arizona physicians (and dentists, veterinarians and nurses) have a vocational obligation to implement such a statewide major disaster plan. Otherwise, we do not deserve the respect of our community, our children, or our grandchildren.

Dr. Baker is a past president of the Arizona Medical Association. He is a member of the ArMA ad hoc Public Health Committee. He recently retired, after 14 years of service, as medical director of the St. Vincent de Paul Medical and Dental Clinic. Dr. Baker helped to found the clinic, which has helped thousands in need of medical and dental care.

**Physicians need to be able to measure radiation levels with a device such as a NukAlert radiation monitor/alarm, a small device that can fit on a key chain.**
After the events of 2001—the terrorist attack in New York City and the anthrax episode—the federal government decided that a robust system of volunteers was needed to augment regular civic agencies such as the police, fire services, and health care. Out of this planning developed the concept of a corps of volunteer health care personnel who would be recruited, trained, and registered at a local level throughout the United States. Originally, the intent was to provide “surge” capacity to augment the regular health care system in the event of a disaster, particularly a bioterrorist attack. As more than 300 MRC units developed across the United States, the purpose was expanded to allow for MRC personnel to assist local health departments that might not have the resources to accomplish all of their regular duties.

The unique aspect of the MRC concept is that each unit is developed based on local needs, priorities, and organization. This allows for great flexibility in the organization of each MRC and ensures that it will be responsive to community needs and structure in the event of a disaster. Some MRCs play a vital role in their community’s public health activities, in areas where a robust public health department has not developed. Others are more attuned to surge capacity training and focus.

Approximately 50 interested persons in Tucson developed the first concept for a local MRC unit, applied for, and received a three-year grant to flesh out the concept. Difficulties were encountered as this group attempted to organize such a unit, one of the major factors being lack of provision for liability coverage of the volunteers. As a result, Drs. Bill Carrell and myself were asked by the Pima County Medical Society to assist the MRC to get beyond the early planning stages. We accepted the responsibility and have accomplished the following:
1. Working with the governor’s office, the attorney general, and Representative Amanda Aguirre (Yuma), along with interested parties throughout the state, we assisted in the passage of H2599, which provides for immunity from, and coverage for, any suit brought against a registered volunteer health professional, while acting at the request of state or local authorities. The bill was signed into effect by the governor in November 2005.

2. We established the MRCSA as a 501(c)(3) organization, enabling us to receive donations as a means of sustaining the organization.

3. We developed a mission and organizational structure for the MRCSA consisting of an advisory board and task forces for medicine, nursing, pharmacy, mental health, allied health, environmental/public health and administration. We have successfully recruited board members and, most of the Task Force leaders.

Advisory Board members include Dr. John Schaefer, former president of the University of Arizona; Don Shropshire, former president and CEO of Tucson Medical Center; Alethea Caldwell Munsinger, former president of the University of Arizona Medical Center; Les Caid, chief of the Rural/Metro Fire Department; Scott Ingram, program director, Volunteer Center of Southern Arizona; Dennis Douglas, director, and Michelle McDonald, MD, medical director, both of the Pima County Health Department; and Chief Brad Olson of the Tucson Fire Department.

Task Force leaders include Ron Spark, MD, (Physicians); Dr. Ted Tong (Pharmacy); Mr. Bill Howe (Allied Health); Bernie Kuhrt, MD, and Alan Levenson, MD, (Mental Health); and Jim Justice, MD (Environmental/Public Health).

We are actively working on a simplified, but precise, credentialing and registrations system under H2599.

4. We have worked with the Pima County Health Department and the city of Tucson to develop close, collaborative, and mutually supportive relationships.

5. We are starting the active recruitment of volunteers in each of the Task Forces.

6. We are beginning to develop the multiple educational, training, and drill tasks for volunteers as they become competent in their new roles.

There are two other Medical Reserve Corps in Arizona: one in Maricopa County, chaired by Dr. Richard Thomas, and one in Yavapai County, chaired by Chris Mayo. It is likely that additional MRCs may develop in other parts of the state.

For further information and to consider volunteering, please send an email to either Dr. Vincent Fulginiti (vfulginiti@comcast.net) or to Dr. William Carrell (wdcjr@comcast.net).
Hurricane Katrina was the first real test of the homeland security and national preparedness system the United States put in place following 9/11. The federal response was, as President Bush said, unacceptable. The question is not who is to blame – the system did not function effectively at any level – but how do we make it better before Mother Nature or terrorists test it again?

Katrina unveiled a preparedness and response system beset by confusion and under stress: agencies struggling to prepare for both natural disasters and terrorism; an expanded post-9/11 workload without a larger workforce; organizational changes and personnel turnover that hindered intra- and inter-governmental communication; and flawed assumptions about the adequacy of homeland security planning and budgets.

Our ability to minimize the impact of a disaster is a key metric in the war on terror.

To fix this, the president has suggested an expanded role for the military, even taking control of disaster response during a future major catastrophe. This would be a federal top-down organization of homeland security, preparedness and response.

It is the wrong approach. Federalizing or militarizing these functions is unwanted by the states and unnecessary. Rather than turning the existing system upside down, we should strengthen it from the bottom up. If we don’t believe state and local authorities are prepared to handle the next crisis, our national objective should be to improve them, not replace them.

They must be prepared to handle the first 48-72 hours on their own. Disaster plans must be current, realistic and regularly tested.

There are many initiatives the federal government can take – creating clear standards, mandates, incentives and cross-sector synergies – to make preparedness and risk management national priorities. Our collective security should be the best we can achieve and not subject to the lowest common denominator.

However, over the long run, a community-based system will be better, more sustainable, and consistent with our values and civil liberties. We need to empower, not supplant state and local officials, who will do the bulk of the planning before the fact; be responsible for the first stage of any disaster; and put the community back together long after the federal government moves on to the next crisis. More importantly, while the federal government can urge the private sector to develop best practices, community leadership is most likely to get individual companies to actually follow them.

The Department of Homeland Security (DHS) has recently reorganized itself to include a new Directorate of Emergency Preparedness and Response. The president nominated Virginia’s top preparedness official, George W. Foresman, to lead it—an excellent choice. Undersecretary Foresman was sworn in by DHS Secretary Michael Chertoff on January 20 of this year. As vice-chairman of the Gilmore Commission, which recommended over 146 domestic response improvements prior to 9/11, Mr. Foresman understands the importance of a national partnership where states, localities, and the federal government cooperate rather than compete for control. We need – and do not yet have – such a partnership.
What should community-based preparedness look like?

First, it should preserve civil authority and reinforce continuity of government. Mayors and governors should be in charge, with the federal government supporting them. Cities and states need to take aggressive action the moment a hurricane is forecast or an incident occurs. They must be prepared to handle the first 48-72 hours on their own. Disaster plans must be current, realistic and regularly tested.

Second, federal support should be more efficient, transparent and flexible. Federal grants should be tailored to meet local needs and national standards. A one-size-fits-all strategy will fail. Grants should cover both equipment and manpower costs. FEMA needs to modernize its logistics system – not by creating its own, but by piggybacking off superior private sector expertise that already exists in every city and state.

Third, if military support is required, the National Guard should take the lead, not the active military. National Guardsmen come from local communities; they can be activated quickly; and unlike federal troops, they can perform law enforcement duties consistent with Posse Comitatus, the law that restricts the regular military from engaging in routine law enforcement. To the extent that the war in Iraq degraded its response to Katrina, the guard needs better equipment, a higher level of readiness and an updated command structure.

Fourth, while the existing Emergency Management Assistance Compact system of interstate mutual aid agreements worked well during Katrina, it also needs to work faster. One idea is to develop a national reserve of first responders, including certified, trained and experienced fire, law enforcement and volunteer coordinators. Regional exercises would be conducted regularly, with arrangements established regarding local reimbursement, liability and command and control.

Finally, since the next terrorist attack is most likely to occur during a workday in a major commercial center and without warning, businesses need to be full participants. Every business location should have a corporate crisis response officer. Private sector representatives should be trained by, work directly with and exercise alongside local first responders. Companies need to be prepared to shelter employees in place until they can evacuate safely. Business continuity plans must be developed in partnership with municipalities. Planning needs to integrate public and private assets that can help keep people informed, get them out of harm’s way and sustain them until communities are functioning again.

Improved national preparedness will require bipartisanship on Pennsylvania Avenue. We need a comprehensive risk-based homeland security strategy backed by the necessary resources to prevent or recover from all hazards, whether natural or terrorist. But the real action must take place on Main Street where the next ground zero is likely to be; where the true first preventers and first responders are; where real change must take place; and where that preparedness will make Americans truly safer.

James Gilmore III is chairman of the National Council on Readiness and Preparedness (www.NCORP.org) and governor of Virginia from 1998-2002.

PJ Crowley is a senior fellow and director of national defense and homeland security at the Center for American Progress and was a special assistant to President Clinton for national security affairs.
In recent years, infectious diseases have shown a new face to practitioners. Locally occurring infections that we are all accustomed to are still present but are joined by new infections not usually encountered in ordinary practice.

The ease of international travel aids the spread of infections from remote places to our community. Two recent examples are West Nile Virus encephalitis and Severe Acute Respiratory Syndrome (SARS). The West Nile Virus (WNV) arrived in New York City from the Middle East in the summer of 1999. It established a focus of infection among birds and spread to humans via mosquito bites in the summer months. By 2004, WNV had encompassed nearly all of the continental United States and Arizona had several hundred locally acquired cases. SARS emerged from China in 2003 and, aided by air travel, caused epidemics of pneumonia in Singapore, Taiwan, and Toronto. It is likely that the trend for new infections to emerge and spread to distant places will continue.

Another source of concern is deliberate use of microorganisms as weapons of terror. During September 2001, *Bacillus anthracis* was spread via the US mail in Washington DC, New York City, and south Florida. Twenty-two cases of anthrax occurred, and 11 of the infected persons died. Federal offices, the Congress, and the Supreme Court all curtailed operations temporarily. The individual(s) responsible for the attack remains at large today.

The infectious disease of the moment is avian influenza that originated in Hong Kong and Southeast Asia. Domestic poultry as far west as Turkey is infected and approximately 150 human cases have occurred. The World Health Organization is concerned that the avian virus could adapt to humans and result in a pandemic.

Each of these examples illustrates the need for practicing physicians to inform themselves and to prepare for managing their offices during an outbreak. Public health officials and our elected representatives have a role in preparing our communities and communicating the facts, but public opinion polls show that Americans will look to their own physicians for advice and guidance in the event of an emergency.

**Getting informed**

An encyclopedic knowledge of global infections is not necessary for preparedness. Instead, access to compact, authoritative and timely information on diagnosis and treatment is sufficient. Modern communication via the Internet puts just that sort of material at your fingertips. During

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**Useful preparedness web sites**

- The Centers for Disease Control: www.cdc.gov Comprehensive site for information about specific diseases, and current communicable disease issues.
- The Arizona Department of Health Services: www.azdhs.gov Home page for the Department of Health Services. For more specific information on preparedness topics use www.azdhs.gov/phs/edc/edrp/. This site has links to the American Medical Association, the American College of Physicians, the American Academy of Pediatrics and other professional associations.
- United States Department of Homeland Security: www.ready.gov. Federal site providing preparedness information to citizens and businesses on preparedness. Some of your patients may be familiar with this site.
an epidemic or a bioterror attack, the Internet will be used to disseminate current data on numbers of cases, appropriate diagnostic tests, and effective therapy. All practicing physicians should have Internet access and familiarity with using a home or office computer. Box 1 lists web sites that provide useful, up-to-date information for the practicing doctor.

To use the sites effectively, visit them prior to an emergency and become familiar with the format each uses.

**Preparing your office**

Medical offices can prepare by developing a written emergency plan that emphasizes infection control techniques (Box 2) to protect you, your family and the patients you serve.

**The plan should include:**

- Indentification of a leader who has the trust and respect of the staff.
- How to report suspicious cases or unusual clusters of cases to your local health department (See the ArMA web site – www.azmedassn.org—for instructions on reporting communicable diseases)
- How to notify your supervisor of suspicious cases
- How to distribute masks and gloves to staff in response to suspicious cases
- How to adjust office appointments in response to a surge of calls from patients
- A communication strategy to keep staff informed, minimize rumors and help staff cope with stress.

Recent natural events such as hurricanes have shown that some mass communication facilities become inoperable at crucial times. The office should have a battery or mechanically powered radio available since radio is the last communication technique to fail.

The Arizona Department of Health Services has a desk-top flip chart, “Preventing Infections in the Medical Office,” that is available upon request by contacting the department at: Arizona Department of Health Services, 150 N. 18th Ave., Suite 150, Phoenix, AZ 85007-3237; Att Leanne Allen or by email: allenl@azdhs.gov.

**Dr. Kelly** is an allopathic (MD) physician specializing in infectious diseases. He is an infectious disease specialist with the Arizona Department of Health Services. He is a member of the ArMA ad hoc Public Health Committee.

**Infection control procedures**

- **Hand Hygiene:** Wash your hands before and after touching every patient. Wash using soap and water, or an alcohol-based hand rub. Gloves are not a substitute for hand washing. Wash your hands before putting on and after taking off gloves.

- **Gloves and Masks:**
  - **Gloves:** Wear gloves when you anticipate contact with blood, body fluids, or any drainage. Dispose of gloves after each patient. Non-sterile disposable gloves are okay for most purposes.
  - **Masks:** Wear a disposable surgical mask when you are within three to six feet of a patient who is coughing or sneezing. Offer a mask to the patient who is coughing or sneezing.

- **Respiratory Etiquette:** Separate patient with respiratory symptoms from other patients by at least three feet (arm’s length) where possible. In waiting and exam rooms, have tissues and hand washing material available.

- **Needle Stick and Sharps Injury:** Prevent injury by wearing gloves while performing a blood draw or giving an injection, using equipment that protects you from injury, and never recapping a used needle. Dispose of needles or other sharp instruments by placing them into a sharps container. If you have a needle stick injury, follow the office protocol for management.

- **Immunizations:** The following immunizations are recommended for office staff
  - Influenza vaccine every year
  - Hepatitis B vaccine
  - Measles-mumps-rubella vaccine or proof of immunity
  - Varicella vaccine or proof of immunity
The role of physicians in disaster response

In December 1967, when both long distance and plane tickets meant something more substantial than today, a phone rang in Leavenworth, Kansas. It was St. Mary’s Hospital in Tucson calling.

An Air Force F-4D Phantom jet had crashed into a crowded holiday supermarket at Alvernon and 29th Street. Homes behind were destroyed as well.

We knew this.

For the first time in my young life, Tucson had made the “We now interrupt this show with an important news bulletin” on network television. We were visiting my grandparents' home for Christmas when the news flash came on about Tucson, about home.

My dad was the neurosurgeon assigned to St. Mary's in case of a disaster. The hospital knew exactly where he was and how to reach him. St. Mary’s was in the process of purchasing tickets so he could fly from Kansas City on a TWA 707. Details of the disaster were still sketchy, but major injuries were expected.

Dad kissed us goodbye and left with Uncle Herb. They were back two hours later. Fortunately, only four people were killed and other casualties were light. He wasn’t needed after all.

Skip forward to 2005. Hurricane Katrina victims were being flown to Tucson. Although an 800-bed reception center had been set up days before, it seemed to be a state secret whether community physicians would be needed to help staff it. No one knew whom to call. Those physicians who appeared at the reception center to volunteer were turned away.

With all the money going into disaster preparedness since 9/11, shouldn’t we have gotten more organized since 1967?

In many respects we are more organized. The problem is the main component, physicians, are not part of the organization. They do not sit in leadership positions; they do not (except for the ED) participate in drills. The Pima County Medical Society (PCMS) is reduced to telling physicians that, if disaster strikes, they should stay near a phone or working radio.

It was not always this way.

In the 1950s, government in Tucson worked closely with physicians to create a civil defense response. This morphed into a purely private system wherein physicians were assigned to a hospital in case of a citywide emergency. They knew where to report and were expected to do so. Every physician had a pager number for identification so that even if communications were down, local emergency broadcasts could ask doctor “761” to report to a given location. After reporting to the hospitals, the pool of physicians could be taken (if needed) to the scene of the disaster.

Physicians in Tucson eventually ran the system. The medical society had an Emergency Medical Services Committee and a Disaster Drill Committee. On May 4, 1980, the medical society staged the first citywide disaster drill—a simulated plane crash with 40 dead and 80 burned and injured survivors. Physicians were the incident commanders and worked well with airport authorities, local police, fire officials, and ambulance companies.

There are no straightforward explanations about how this system was lost. Some suggest that since we had no disasters it was a case of “use it or lose it.” Others point to the rise of paramedics, then EMTs, and the professionalism of other first responders. Some point to a lack of communication within the profession, with the number of doctors in Tucson rising ten-fold between 1960 and 2000 with no common focal point. Hospital power has increased, and physician time demands have changed.

All these reasons are probably valid. But we need to do better.

There was a disaster drill in 2003 at the airport. Police, firefighters, and
hospitals all participated, but not one doctor in 100 here knew the drill took place.

PCMS has been part of the National Disaster Medical System since 1994. We joined the Metropolitan Medical Response System in 2002 and have helped form the local Medical Reserve Corps. Whenever there is a disaster, 9/11 to Katrina, we are part of the discussion about what we can do better.

It has taken time, but we have finally convinced most entities that, as far as the physician segment is concerned, we can’t just rely on call schedules. Many physicians don’t have hospital privileges; others certainly don’t have a “home” hospital. Doctors are never drilled so they don’t know where to report, when to show, where to park, or even who is in charge. Our object is not to take over the system again (which is unrealistic because all the money involved is flowing through city government) but to make sure the pieces are in place for the next disaster.

One very bright success has been the Medical Reserve Corps. It was begun in 2002 at the call of the federal government and placed under the aegis of the Citizen Corps Council. Community leaders who had been trying to find a role for retired physicians since the early 1990s began attending meetings with health department officials. The Tucson Volunteer Center won a three-year grant to staff and build the Tucson Medical Reserve Corps.

There were two main problems. The federal government did not give much guidance about what the MRC was supposed to do or who was going to cover the liability.

Pima County would cover liability for health care workers called on to volunteer provided it controlled the scope of work and directed things. The county found it could cover most prospective volunteers through blanket insurance policies. The exception: physicians. Each doctor had to be individually underwritten. The county found covering one volunteer doctor cost more than blanket coverage for all other volunteer workers!

The MRC used non-physician medical professionals and technicians to create a “vaccine strike team” for use in bioterror and chemical incidents. This strike team was successfully drilled when Tucson was part of the National Pharmaceutical Stockpile simulation in 2003. It has become a national model for other local medical reserve corps that are trying to determine what role to play.

Another national model is how we solved the liability issue in Arizona. Under the leadership of William Carrell, MD, and Vincent Fulginiti, MD, HB 2599 was passed last year, giving trained and credentialled vol-

unteer physicians the same liability protection any state worker has once the state declares a disaster. Further, it covers physicians during training. Work is being done on what is needed to meet the state standards on credentialing and training.

Our MRC is concentrating in three areas: 1) to work with the fire department for deployment at a mass casualty triage site, 2) to help primary care physicians, with or without hospital privileges, use their offices to meet the walking wounded surge, and 3) to determine the need for volunteers at hospitals (especially for limited shifts on days three and four after a disaster).

Grant money is running out for the Tucson MRC so it has incorporated into a 501(c)(3) entity. It will solicit funds and build for a future we hope never comes.

Last summer, at the Arizona Medical Association House of Delegates meeting, the PCMS delegation unanimously supported a resolution introduced by the ArMA ad hoc Public Health Committee calling for ArMA and physicians to take a leadership role in working in disaster planning. The time for physician leadership is now, in the un-sexy planning stages. It has to be done.

Next time, we won’t get 87 people flown in from a flooded southern city. We may have 8,700 critically injured people from a Los Angeles earthquake, plus thousands of self-evacuated people pouring in.

You will be pulling the sled. Let’s make sure it is in as good a condition as it can be and goes in a direction that benefits us all.

Steve Nash is executive director of the Pima County Medical Society.
Suddenly, Americans are beginning to recognize that it is necessary to contemplate the use of terrorist nuclear or radiological weapons on American soil. The good news is that you will most likely survive such an attack. The bad news is that you will wish you had been better prepared.

Relatively simple measures and basic training could enormously reduce casualties in such an event. These measures are not being taken. We are a nation in massive denial.

Following a radiological attack, the nation will turn to the medical community for direction and, unless things change, find confusion and disarray. You could find mobs of people converging on your facility or office – some injured, some contaminated, many in psychological distress. Are you prepared? How will you identify those who are contaminated and keep them from contaminating others or your facility? The national ignorance of, and hysteria over, radiation could lead many to your facility who are simply frightened. How will you greet them?

Radiation is conveniently measured in Roentgens (R). A dose of 100 R received within days is about the threshold for clinical radiation symptoms. The LD50 is around 400 R to 600 R. The intensity of radiation (dose rate) is measured in R/hr. If you stay in a 1 R/hr environment for 4 days you may begin to experience nausea, weakness, immune deficiencies, and other problems. One instrument popular with Department of Homeland Security (DHS) responders displays “H” for “Hot Zone” at any rate above 13 mR/hr (0.013 R/hr) — a level that is sometimes encountered on airline flights and certainly not life threatening. How will your staff respond to an emergency worker telling them that the waiting room is a “Hot Zone?” Clearly some planning and training is demanded by the risks we face.

Some basic requirements:

- A plan for triage and patient flow that avoids cross-contamination (entrance-only and exit-only portals)
- An authoritative person to manage the entry process (possibly armed)
- A decontamination area (showers, baby shampoo, baby wipes, disposal facilities for clothing, a store of blankets and replacement coverings)
- A separate decontamination area for staff and responders
- A stock of potassium iodide
- Printed material to reassure patients about radiation and give them something to do
- Simple radiation measurement equipment and staff who understand their use (refurbished civil defense meters are appropriate)
- Dosimeters for staff
- Stored water, food, flashlights, batteries
- Communications equipment with backup power sources
- A plan for patient transport after release
- A plan to encourage your staff and increase the likelihood of their reporting for and staying on duty

What about instrumentation?
The Arizona Department of Health Services has allocated funds for responders and localities to purchase radiological instruments. The
focus in instrument deployment has been on interdiction rather than nuclear attack survival. Because the standards established for these instruments demanded extreme sensitivity, stability, and accuracy, the instruments are very expensive, and relatively few are fielded. Worse, most of the instruments carried by responders are so sensitive that they will be overloaded and useless in a post nuclear detonation environment. During the Cold War, nearly six million high-level dose meters, rate meters, and survey meters were distributed around the country. This stockpile was largely destroyed by the government, except for a small portion that was auctioned off. These “surplus” CD instruments can be purchased at reasonable prices, but it is imperative that they be refurbished and recalibrated because they are several decades old.

Although there is a bewildering array of instruments to choose from, two basic types of instruments are appropriate for medical facilities—the Geiger counter and the ion-chamber survey meter. Geiger counters are very sensitive. If the Geiger probe is placed in a container of diet salt (potassium chloride), it will produce a frightening rapid clicking that can scare all but the well informed. The Geiger counter is useful for decontamination because it can help pinpoint the source—fingernails, hair, nasal passages, etc. It may be best to use earphones or simply watch the meter when using the instrument, as the psychological impact of the sound could cause unnecessary alarm. The ion-chamber survey meter is useful for higher level measurements and for identifying adequate shelter if the facility itself is in a high exposure area. A new type of device, the NukAlert®, is like a more slowly responding survey meter that, while not appropriate for decontamination work, is an inexpensive personal monitor that could encourage workers to report for and stay on duty, especially if they know that their families can measure exposure rates at home. The old standby “peep through” pen-style, quartz-fiber dosimeters are appropriate and inexpensive; they should be worn by anyone dealing with contaminated people or materials. The dosimeters should be checked often.

It is not necessary for medical facilities to have the extremely expensive analyzers required to identify specific isotopes. Government agencies deploy these devices and can readily determine and advise, if specific radionuclides are involved, as in a “dirty bomb.” It is better to have a quantity of basic instruments that can be cross-checked than a very few sophisticated, expensive devices. It is imperative that everyone on your staff has at least a basic understanding of radiation measurement, protection and decontamination methods.

Much of the planning, training and preparation required to effectively respond to a nuclear emergency are also appropriate for chemical and biological threats. It is not sufficient for the facility to have a plan. The plan must be owned and understood by everyone on your staff, even office workers, as they may be pressed into action with little warning. If you fail to plan—you plan to fail.

References and resources:
Berger, ME; Leonard, RB; Ricks, RC; Wiley, AL; Lowry, PC; Flynn, DF. Hospital Triage in the First 24 Hours after a Nuclear or Radiological Disaster. Available online at: http://www.orau.gov/reacts/triage.pdf

Philip Smith is president of Kno-Rad, Inc. He has been involved in electronic design since 1974, and is the co-inventor of the NukAlert keychain radiation meter.
Imagine the worst. Katrina, Banda Aceh, 9/11. As a doctor, your mind goes to people, mass casualties, and never-ending work but, probably, not to communications. In each of these events, the communications infrastructure was totally destroyed or severely damaged. News to the outside world was crippled and, in each case, amateur radio played an essential role in carrying the dreadful news to ears that could bring help and relief. These were all dramatic scenarios. Almost unimaginable and impacting communications centers in ways that are really beyond the best-laid plans.

Time and again amateur radio has been there when all else fails. Perhaps you have a mental image of a lone radio operator (a “ham”) in some isolated setting desperately hanging on, resolutely trying to contact the outside world. That image can be valid. It certainly was at Aceh and on the Indian islands of Andaman and Nicobar as the tsunami obliterated everything in sight. But what followed soon after was a marshaling of resources by highly competent hams that were able to piece together radios and equipment to support rescue operations until more help arrived. On Andaman, a group of mainland hams had gone on a holiday. In short order they were not only getting the word out, but also supporting local first responders from the medical, military, and law enforcement communities. The Indian Army quickly rushed them more equipment knowing that it was in competent hands. In Aceh province, hams were the only means of communications for extended periods of time.

Amateur radio is a hobby. Operators are tested and licensed by the Federal Communications Commission to insure that they don’t interfere with other radio services or cause harm, although experimentation is encouraged. Hams come from all walks of life. Doctors to be sure, engineers, nurses, police and firemen, heads of state, cardinals, almost all astronauts, and Randal McCloy Jr. (the sole survivor of the West Virginia coal mining disaster in January) are a few of the types of people who hold a license. Our common interest is in radio and its advancement. We are also committed to helping our fellow man in any way that radio can.

Hams have sought and found a real need for their skills, knowledge, and equipment. In Pima County, we have several organizations committed to emergency and disaster operations. All the hospitals in the Tucson area provide both equipment and space for ham teams to operate as back up communications resources in emergencies. We routinely drill and participate in emergency preparedness exercises with first responders of all types. We transmit triage and transportation information to each hospital, as that data becomes available at an event. We are ready to provide
each hospital with back-up communications during communications outages. In Pima County, through our RACES group, we provide direct communications support to the County Health Department in an ever increasing number of ways. The Radio Amateur Civil Emergency Service is a federally regulated concept that allows local government bodies to use and sponsor our volunteer expertise and services.

The state of communications in America is almost beyond comprehension in its reach and capability. So why do we need to spend corporate and public money and time on amateur radio? There are several answers. The engineers who design commercial and government and public service communications are often also hams; our level of expertise tends to be quite high. Many of us are good teachers and pass along our knowledge to those in our hobby who come from other fields, facilitating cross-pollination. While commercial systems are extremely sophisticated and operate superbly under normal circumstance, disasters are not normal. Earthquakes, hurricanes and tsunamis knock things down. They cause system overloads that, in turn, cause system crashes. They lose power and they break. Amateur radio is, of course, subject to some of those same problems—but we know how to maintain our equipment, and we operate under a concept of distributed architecture. Equipment and people tend not to be centralized in amateur radio, and so the single operator somewhere can function although whole systems of equipment and people have crashed and burned. Ambulances on the ground or in the air have several frequencies available for communication. Amateurs, by virtue of their broad privileges, have entire bands allocated throughout the radio spectrum. Thus, both short and long haul communications can be obtained. This means that, regardless of interference problems, we can find some way to get through.

In the last 30 years, various civilian groups, in cooperation with state and local law enforcement, have performed some 10,000 search-and-rescue missions in the greater Tucson area. In nearly every mission, amateur radio comes into play. For 10 or more years now, amateurs have been using a ham-designed technology called Automatic Position Reporting System (APRS). You are just now seeing it in commercial applications. It can have your cell phone automatically tell a dispatcher exactly where you are. APRS has been helping searchers keep track of each other in desert and mountainous topography as well as helping helicopters find the searchers and their patients. It can also help police find your stolen car or let the “OnStar” dispatcher get you medical help.

There are some 14,000 licensed hams in Arizona. In Pima County there are more than 3,000. We are volunteering our time and resources constantly to public service in many ways. You will find us to be professional, knowledgeable, and ready to serve.

Mr. Thompson is a retired telecommunications CEO. A life-long ham wannabe, he has been licensed as N3SRU since 1993. He is active in emergency communications in Southern Arizona. He can be reached via e-mail at n3sr@arrl.net.
In the summer of 2005, the Rural Metro Fire Department, operating in Pima County, understood the need for improved emergency responder preparedness in the light of current threats. With this understanding came the responsibility to train and equip its responders, allowing them the tools necessary to complete their mission.

That summer, the department took a close look at its operations and made the determination that there were areas that could be improved upon regarding its response to a Weapons of Mass Destruction event. With the bombings in London still fresh in the public’s mind, the department identified that a radiological response program and further operating guidelines were needed. This was to include equipping all front-line engine companies with radiological monitoring devices and sending a large portion of its firefighters to Technical Emergency Response Training located in Anniston, Alabama, at the Center for Domestic Preparedness. As Rural Metro Fire Department is a privately owned fire department, and operates under a budget, with different constraints than those of a municipal system, cost became an issue.

As detectors were researched, it was found that much of the more popular detectors cost thousands of dollars. A cheaper solution was needed. We identified and contacted Physicians for Civil Defense, an Arizona-based nonprofit organization. We accepted a donation of 15 “NukAlert” monitors, which the department immediately placed in

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service on the front-line engine companies.

With this deployment, we needed to train our crews about potential radiological sources and the use of the devices. The lead officer at each station was assigned the responsibility for educating all crewmembers on the proper monitoring with the device. Then a crewmember was designated to carry the device on his person each 24-hour shift, and account for it at crew change; they are easily clipped to the firefighter’s belt.

Individual equipment numbers were designated to the devices for accountability purposes.

Crews were to understand that the “NukAlert” is designed to alarm when a gamma or x-ray source is encountered. It was also understood that the device was not meant to be used as a source meter. The instrument emits a chirping sound when exposed to radiation at a dose rate of 0.1 R/hr, the approximate equivalent of 0.1 rem/hr, a dose rate that is significantly abnormal but not an immediate danger to personnel. The number of chirps increases as the radiation intensity increases, on a logarithmic scale. A table printed on the device itself indicates the dose-rate that corresponds to a certain number of chirps.

Based upon current and national guidelines, Rural Metro set the limits given to the box below for Radiological Dose (Accumulative) and Radiological Dose rates (R/hr).

All “Nuke Alarms” require Battalion Chief notification for direction on medical evaluation and documentation.

If a radiological dispersal device (RDD) or nuclear weapon is used in or around Tucson, Rural Metro personnel could help identify “hot” areas and safe areas. The ability to identify areas where there is not an immediate radiation risk would be very valuable in preventing panic and in allowing firefighters, and other first responders, to perform their normal life-saving functions.

Mr. Thompson is a firefighter with the Rural Metro Fire Department in Tucson, Arizona.

### Guidelines

10 rem for protection of major property

25 rem for life saving or protection of large populations

>25 rem for life saving or protection of large populations only by volunteers who understand the risk.

**Contaminated Persons**

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Spring 2006