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INVITED ARTICLE

Making difficult ethical decisions in patient care during natural disasters and other mass casualty events

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OBJECTIVE: Recent experiences in the United States with unprecedented terrorist attacks (9/11) and a devastating natural disaster (Hurricane Katrina) have demonstrated that the medical care of mass casualties during such disasters poses ethical problems not normally experienced in civilian health care. It is important to 1) identify the unique ethical challenges facing physicians who feel an obligation to care for victims of such disasters and 2) develop a national consensus on ethical guidelines as a resource for ethical decision making in medical disaster relief.

STUDY DESIGN: A survey of pertinent literature was performed to assess experience and opinions on the condition of medical care in terrorist attacks and natural disasters, the ethical challenges of disaster medical care, and the professional responsibilities and responsiveness in disasters.

CONCLUSIONS: It is necessary to develop a national consensus on the ethical guidelines for physicians who care for patients, victims, and casualties of disasters, and to formulate a virtue-based, yet practical, ethical approach to medical care under such extreme conditions. An educational curriculum for medical students, residents, and practicing physicians is required to best prepare all physicians who might be called upon, in the future, to triage patients, allocate resources, and make difficult decisions about treatment priorities and comfort care. It is not appropriate to address these questions at the time of the disaster, but rather in advance, as part of the ethics education of the medical profession. Important issues for resolution include inpatient and casualty triage and prioritization, medical liability, altered standards of care, justice and equity, informed consent and patient autonomy, expanding scope of practice in disaster medicine, and the moral and ethical responsibilities of physicians to care for disaster victims.

On Tuesday, September 11, 2001, the American Academy of Otolaryngology–Head and Neck Surgery Foundation was holding its scientific meeting in Denver, CO. The morning plenary sessions were underway when early reports of tragic events in New York City, Pennsylvania, and Washington, DC, began to be seen on the television screens in the common areas of the Denver Convention Center. As the events unfolded quickly, the scope of the tragedy soon became apparent. The leadership of the AAO-HNS/F made the decision to continue with the educational meeting and kept the attendees apprised of what was happening. Because the national airspace was closed to air travel, individuals and groups began making alternative travel plans, including purchasing cars, renting vans and trucks, and even chartering buses. For those physicians who lived in the eastern United States, returning to their homes and work was vitally important. Because there remained the possibility that terrorist attacks might occur in other parts of the country, everyone wished to travel home. Many physicians made the long trek to New York City to volunteer as medical care providers, if needed. There was a general sense of professional responsibility and willingness to help, even at personal risk. Fortunately, the terrorist events were limited in scope and location, but they remain the largest death toll from this type of event in the United States to date.

The worst natural disaster in US history occurred on August 29, 2005, when Hurricane Katrina devastated the Gulf cities of Biloxi, MS, and New Orleans, LA, and all areas between these cities. It is estimated that the forces of the hurricane were greater than that of the atomic bomb blasts on Hiroshima and Nagasaki, Japan, in World War II. The hurricane itself was a bad one, but the resultant loss of integrity of certain sections of the levees in New Orleans resulted in a tremendous flooding of much of the mid-city and isolation of many hospitals in the area. Dr Anna Pou, an AAO-HNS Fellow and academic colleague of many, was on duty at Memorial Medical Center in New Orleans. Although many other physicians in New Orleans were either fleeing the city's flooding with their families or unable to reach their medical facilities, Dr Pou made the brave decision to stay and provide medical care to the patients and staff who, like her, were isolated in the facility.

As a head and neck surgeon, Dr Pou was accustomed to caring for postoperative patients in the surgical intensive care unit, but during her ordeal at Memorial, she also took responsibility for caring for very sick and nearly terminally ill patients in an acute care long-term facility located within Memorial Hospital. As resources began to become scarce and the conditions in the hospital became more extreme, Dr Pou and other health care providers found it necessary to develop a simple priority system for patient evacuation

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when outside relief finally materialized. Under extremely harsh conditions, Dr Pou made medical decisions that cannot be second guessed by those who were not there. After her heroic efforts, Dr Pou found herself facing charges of homicide in the deaths of four elderly and critically ill patients at Memorial. Fortunately, after nearly 2 years of difficult personal and legal challenges, Dr Pou was exonerated by an Orleans Parish grand jury's refusal to indict her. During the ordeal, Dr Pou was supported by the AAO-HNS, the American Medical Association, the American College of Surgeons, and the Louisiana State Medical Society.[1-5] These societies acknowledged the difficult decisions that were required under conditions not previously experienced in the US civilian health care system.

DISCUSSION

There are multiple layers of ethical issues that have arisen in the aftermaths of the terrorism events of 2001 and the natural disaster of 2005. At the very foundation of the concerns raised is the question of how much personal risk and sacrifice are required or expected of physicians during such mass casualty events. At the higher level, it is the difficult issue of how to make ethical decisions in caring for patients, both existing patients and casualty patients, in the face of limited resources and expanding scope of the disaster. As has been clearly emphasized by the situation with Dr Anna Pou, an otolaryngologist–head and neck surgeon who voluntarily placed herself in a position to render a level of care to patients clearly beyond her training and expertise, most physicians in the United States are ill prepared to face the unique ethical decision making that is required in such situations. It is now apparent, with the constant threat of future terrorist attacks and natural disasters, that consensus national guidelines must be developed that will assist volunteer physicians to make ethical, yet appropriate, decisions in the midst of such uncommon and challenging situations.

Challenges of Disaster Medical Care

There are both similarities and differences in the challenges posed by bioterrorism events and natural disasters. If taken in good part, bioterrorism events have the potential to place the physician at greater initial and temporally increasing personal risk for contamination and exposure to toxins or radiation from both the event and the affected patients.[6] With natural disasters, the initial event may pass, and the subsequent risks are lower with the passage of time.

Past and current disaster response plans have primarily been based on modern military models that have evolved over the years, as both the technology of war and the technology of medicine have advanced.[7] These models depend on a defined area of involvement, with initial treatment of casualties on site and subsequent evacuation by air or ground to a more sophisticated treatment facility in a nearby "safe" area. The terrorist events of 9/11 were sufficiently isolated so that this model was generally effective, although the Pentagon attack resulted in a rapid medical response on the grounds of the Pentagon itself. Using the military model and building upon the experiences of 9/11 and Hurricane Katrina, as well as the events of worldwide earthquakes and tsunamis, a new specialty of medicine is emerging—"disaster medicine." A major issue that was found to be a major aspect of the aftermath of Katrina and is currently being addressed, is that of the "surge capacity" of US hospitals, in which acute casualties may overwhelm hospitals, requiring a prioritization of care of both the newly ill casualties and the chronically ill inpatients.[8,9]

There has been significant planning by agencies of the federal government since these two disasters, in good part because the United States was ill prepared to handle these disasters, both from a medical and a response preparedness perspective. The US Department of Health and Human Services issued a directive entitled *Bioterrorism and Other Public Health Emergencies—Altered Standards of Care in Mass Casualty Events* as a federal guide in response to the 9/11 terrorist events and the subsequent anthrax attacks.[10] One of the main issues addressed by the guide was "how current standards of care might need to be altered in response to a mass casualty event in order to save as many lives as possible." Additionally, the report proposed that "the basis for allocating health and medical resources in a mass casualty event must be fair and clinically sound." As part of the recommended use of altered standards of health and medical care, a model was proposed for emergency state health powers that recognized the difficulties of providers and institutions when providing care under stress with less than a full complement of resources. It was recommended that the plan would "have to provide for 'hold harmless' agreements or grant immunity from civil or criminal liability under certain circumstances."

Rolfsen[11] addressed the ethical issues of liability or criminal prosecution in a disaster situation in the Journal of the Louisiana State Medical Society. He stated, "During disasters such as Katrina, many deaths of both previously healthy and chronically ill patients can be expected. Despite society's tendency to attempt to place blame for these tragedies, attributing causation of the deaths to medical providers is a complex process." Contributing to the complexity are the harsh and unusual conditions under which medical care must be provided in a disaster, and the overwhelming requirements for medical resources in the face of rapidly dwindling supply. Medical care during such disasters should likely fall under a state's Good Samaritan act to provide freedom from undue legal liability for the providers.

Professional Responsibilities and Responsiveness in Disasters

A major issue for discussion and guidance is that of the willingness of physicians to participate in the care of patients injured or ill from terrorism attacks or extensive

natural disasters. In the earlier example of the rallying of US physicians to be of assistance in the immediate aftermath of the 9/11 events, it can be contrasted to the isolation of physicians from New Orleans after Katrina who were unable to reach their hospitals because of flooding and criminal activities. Because most of the ongoing medical care of the Katrina victims took place at a distance from the actual flooding, many physicians volunteered to staff the shelters and make-shift medical treatment facilities where hundreds of thousands of individuals received medical care. Infectious diseases were rampant in the victims of the hurricane, and some analogy might be drawn from physician volunteerism in severe acute respiratory syndrome (SARS) pandemics. Ruderman and associates[12] reported on the issue of "the duty to care" by health care professionals. They noted that physicians and nurses who volunteered during the SARS pandemic in 2003 "continue to struggle with the aftermath of the crisis." They noted that there are no unique guidelines for the moral obligation of physicians to care for SARS victims and urged that "organizations give clear indication of what standard of care is expected of their members in the event of a pandemic." They further recommend that there is a pressing need to clarify the rights and responsibilities of health care providers during an infectious disease outbreak, and that "these rights and responsibilities ought to be codified in professional codes of ethics."

The American Medical Association has addressed the issue of physician obligation in disaster preparedness and response in its Code of Medical Ethics.[13] As part of the "Opinions on Professional Rights and Responsibilities," the Code states: Because of their commitment to care for the sick and injured, individual physicians have an obligation to provide urgent medical care during disasters. This ethical obligation holds even in the face of greater than usual risks to their own safety, health, or life.

Yet there remains the question of whether physicians in the United States (and specifically otolaryngologist–head and neck surgeons) are properly prepared for, and willing to, participate in disaster relief of a significant magnitude, especially when there is grave personal risk. Alexander and associates[14] used a national, cross-sectional, random-sample survey in 2003 to address this issue. Seven hundred forty-four physicians responded to the survey. Only 43% of emergency physicians and 21% of primary care physicians agreed that they were generally well prepared to play a role in responding to a bioterrorism attack. The majority of the respondents believed that disaster preparedness should also include infectious pandemics.

Alexander and Wynia[15] expanded their examination of physicians' feelings about bioterrorism events and their responsibilities to their willingness to treat patients despite personal risk. Eighty percent of respondents reported that they would be willing to treat affected patients in the face of a hypothetical outbreak of an "unknown but potentially deadly illness."

Belief in a duty to treat was associated with their willingness to treat patients under conditions of personal risk. The authors concluded that "the threat of new disease outbreaks, from bioterrorism or natural causes, has provided an opportunity for physicians to rearticulate and reaffirm longstanding ethical principles regarding the duty to treat."

Making the decision to care for patients in the face of a nuclear, biological, or chemical terrorist attack; an infectious pandemic; or in an isolated hospital in a natural disaster caring for critically ill patients beyond one's area of expertise requires extraordinary commitment and courage. This level of obligation is similar to that emulated by combat medics and military surgeons who care for wounded soldiers on the battlefield under direct fire themselves. There is no higher achievement of moral commitment and professional dedication than this. However, it must be recognized that not all physicians possess the capabilities to administer effective care under such conditions, or at least may not know whether or not they can until the actual event occurs. The AMA Code of Medical Ethics notwithstanding, although it will not be possible to count on every physician to participate in the direct medical care of patients under such conditions, there certainly are other important ways that physicians can be of benefit to the medical disaster relief, such as resource allocation and personnel coordination.

Ethical Considerations for Medical Care in Disaster Relief

Larkin and Arnold[16] have characterized the extraordinary virtues required of physicians who respond to terrorism events in the face of triage, system overload, and ethical decision making with every patient—"prudence, courage, justice, stewardship, vigilance, resilience, and charity." These are admirable traits that few of us possess in their entirety. They also raise several issues that need to be discussed and guidelines to be provided before the situations might actually be encountered, including the above seven cardinal virtues:

- Prioritizing care of VIPs, civil servants, leaders, military, and health care personnel
- Maintenance of privacy in the throes of overcrowding and media's "right to know"
- Care of prisoners or terrorists
- Reporting requirements that impact individual patient liberty, confidentiality, and HIPPA [Health Insurance Portability and Accountability Act of 1996] rules
- Procuring informed consent for vulnerable victims under duress
- Extending provider scope of practice at the limits of surge capacity
- Balancing provider roles as agents of state, public health, or individual patients

The authors further propose that "virtue-based ethics are more adaptable to the multiplicity of rapidly changing disaster circumstances than mere principles, rules, and proto-

cols, particularly since the scope, magnitude, and dynamics of a particular terrorist challenge cannot be determined in advance." They applied the seven cardinal virtues to times of terror and how they might be helpful to physicians who find themselves overwhelmed by the tasks at hand in caring for disaster victims. Of these virtues, justice, stewardship, and charity imply a sense of obligation for physicians to attend to the sick and wounded, regardless of personal risk. However, "virtue-based ethics" reflects primarily the responsibilities and obligations of physicians to care for victims of such disasters, whereas "utilitarian-based ethics" requires physicians to make medical decisions based on the resources available and a triage system that favors applying those resources to victims who are predicted to have the best chance of survival. As with many ethical dilemmas, virtue-based ethics and utilitarian-based ethics may be in opposition, and the solution may lie in identifying the best applicable aspects of both to the situation at hand.

Weapons of mass destruction cause a particularly difficult challenge to physicians because of the dosage-related prognosis for exposed victims and the personal risk to physicians of non-decontaminated patients. Pesik and associates[17] recommend that triage of the victims be ethically based on the medical model of "best prognosis." Under this model, the patients are triaged according to their prognosis or survivability. The authors suggested that "if something cannot be accomplished (i.e., saving all lives with the limited available resources), then there is no ethical obligation to do so." However, whatever model of triage is used in disaster management, the physician's obligation is to care for patients/victims in such a manner as to provide the most benefit to the most patients. The physician assisting in disaster medical relief must move from doing the most he/she can do for each individual patient to doing what can be done for those who have the best chance for survival. This is a difficult transition, and one that may not be easily made without prior planning and acceptance of a new care model.

In a commentary on US health policy in the aftermath of Hurricane Katrina, Rosenbaum[18] proposed that the apparent need to improve the public health system in this country to better respond to disasters might also have a positive effect on the just provision of health care for the underserved and low-income population. As exposed by the hurricane effects, the majority of the victims were those who were unable to escape from the flooding, primarily because they lived in the low-income areas adjacent to the levees, as well as not having the transportation capabilities to escape before the hurricane struck. The author admonished that "the notion that the world's most powerful nation would continue to lurch from disaster to disaster, jury-rigging inadequate and temporary solutions, is simply untenable." Disasters such as Katrina have the ability to expose the frailties of the medical system, and thus, the potential inability to adequately support the efforts of conscientious physicians who put themselves in harm's way to care for the victims.

Educating Physicians in Preparation for Ethical Decision Making in the Clinical Care of Disaster Victims

If physicians accept the tenet that it is a professional obligation to care for victims of terrorism attacks and extreme natural disasters, then how can the medical profession best prepare physicians for this role? Wynia and Gostin[19] reaffirmed that there is sufficient agreement in the profession for physician obligation to treat in these circumstances. Yet, it does not serve either the physician or the potential victims/patients well for a physician to be ill prepared to deal with a wide range of nuclear, biological, chemical, infectious, and other medical problems without adequate ethical guidelines. An integral part of such preparation would be the development of ethical guidelines, both principled and practical, emphasized by case-based scenarios, to be a major part of undergraduate, graduate, and continuing medical education.

In a recent study of the self-assessment of public health workers' preparedness for bioterrorism or other public health disasters, the authors identified a wide range of perceived needs for additional training.[20] They suggested using competency-based goals, which would be assessed by drills, exercises, and tests. This approach is not unlike the American graduate medical education system of competency-based learning, with specific goals and objectives. It is possible to apply this system to ethical decision making in disaster medical response, as well.

However, before educational models are developed to teach ethical decision making in disaster medicine, it will be necessary for national discussions to occur, with the development of consensus guidelines across medical and surgical specialties that will encourage both virtue-based ethics as well as the cardinal principles of ethical behavior by physicians. Such guidelines would need to recognize the practical issues of need/prognosis-based triage, both of incoming casualties as well as patients already hospitalized and requiring large amounts of medical resources. Inpatients with do not resuscitate orders and those who are terminally ill would likely be placed in the "expectant" category of patients, with the resources currently applied to their care reallocated to incoming patients with a better chance of survival, save for comfort care and pain palliation. Once there is a national consensus within the medical and nursing professions, then the public needs to be educated about the changing requirements for ethical decision making under the dire conditions of disasters. Public education will not completely alleviate controversies and concerns about triage, but it would be quite helpful.

The educational curriculum for ethical decision making in disaster medicine should become a part of the medical school curriculum, as well as for resident physicians in all specialties. Until the students and residents have progressed into practicing physicians, there will be a need to provide continuing medical education courses on this subject for both community and academic physicians, who will bear

Table 1
Model curriculum for ethical decision making in disaster medicine

- Self-care first, then patient/victim care
- Ethical elements of disaster medical triage
  - Prognosis for survival
  - Improving quality of life
  - Symptomatic vs asymptomatic
    - Can early treatment prevent symptoms?
  - Priority given to health care providers, first responders, or military who can save or protect others
    - How to respond to threatening and demanding victims
    - Sympathy, empathy, and objective triage
    - Caring for injured terrorists or criminals—what is one's obligation?
  - Amount of resources required vs what is currently available
    - Can revisit patient requirements if/when more resources become available
  - Triage system for inpatients
    - Can be evacuated or given minimal care
    - Amount of resources required for care vs allocation of resources to others
    - Can be evacuated to other location rather than hospital setting?
    - DNR or end of life?
    - Maintaining comfort care and pain palliation for patients
    - The principle of "double effect" as applied to casualty care
  - Good Samaritan laws by state and implications for disaster medicine
  - Medical liability in disaster medicine
  - Altered standards of care in mass casualty events
  - Justice and equality of care in disaster medicine
  - Informed consent and patient autonomy
  - Advising hospitals in ethical considerations during the development of hospital-based medical disaster plans
  - Expanding scope of practice in disaster medicine—when and how
    - Capabilities, training, and knowledge of physician vs actual risk to patient
  - The moral and professional obligation of physicians to alleviate pain and suffering in disaster relief vs self-interest and care of one's family—an ethical dilemma
  - Euthanasia and physician-assisted suicide under conditions of terrorist events and natural disasters—avoiding the pitfalls
  - HIPAA regulations and patient confidentiality
  - Case- and scenario-based studies in application of principles of disaster medicine

the responsibility for caring for victims of terrorist attacks and extreme natural disasters. Table 1 is a proposed model curriculum for ethical decision making in disaster medicine.

CONCLUSIONS

It is necessary to develop a national consensus on the ethical guidelines for physicians who care for patients, victims, and casualties of disasters, and to formulate a virtue-based, yet practical, ethical approach to medical care under such extreme conditions. An educational curriculum for medical students, residents, and practicing physicians is required to best prepare all physicians who might be called upon, in the future, to triage patients, allocate resources, and make difficult decisions about treatment priorities and comfort care. It is not appropriate to address these questions at the time of the disaster, but rather in advance, as part of the ethics education of the medical profession. Important issues for resolution include inpatient and casualty triage and prioritization, medical liability, altered standards of care, justice and equity, informed consent and patient autonomy, expanding scope of practice in disaster medicine, and the moral and ethical responsibilities of physicians to care for disaster victims.

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None.

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