

Virtual Mentor

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Natural Disasters, Quarantine, and Public Health Emergencies

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FROM THE EDITOR

Preparing for and Responding to Mass Casualties and Disasters

This issue of *Virtual Mentor* tackles the myriad ethical and legal questions that arise in natural disasters, quarantine, and public health emergencies. Specific topics include disaster preparedness and education, illness prevention (including quarantine), diagnosis and treatment of epidemic disease, disaster response, state policies for public health emergencies, research ethics, and media presence during natural and manmade disasters.

Addressing disaster preparedness and education, John Broach, Mary-Elise Manuell, and Andrew Milsten from the University of Massachusetts describe a novel, all-hazards preparedness curriculum developed by the Center of Excellence in Emergency Preparedness Education and Training (CEEPET). This interesting program is designed to recognize and meet the disaster preparedness needs of four types of health institutions in eastern Massachusetts.

Illness prevention is also explored in two clinical cases. The first scenario concerns mandatory influenza vaccination of health care workers. David W. Ross, from the State University of New York (SUNY) Downstate Medical Center, and I examine the duties of beneficence and nonmaleficence that physicians owe patients in the light of physicians' own right to autonomy and the WHO's recommendation that restrictions on rights in times of emergency be both necessary and reasonable.

Quarantine is a state-enforced method of preventing or limiting the spread of disease. In a second clinical case commentary, Nikita Joshi and Bonnie Arquilla from the SUNY discuss the mandatory nature of quarantine. They conclude that, while physicians overseeing quarantined individuals do not have the authority to release anyone, they do have professional responsibility for those nonsymptomatic, possibly future patients.

Though hypothetical, this case scenario draws its facts from the 2003 SARS epidemic during which advisories against unnecessary travel were issued in Guangdong Province, China, Hong Kong, and Toronto. In the clinical pearl, Adriel Malave and Elamin M. Elamin from the University of Florida highlight key clinical and epidemiological information about the viral infection known as SARS (severe acute respiratory syndrome) and the lessons learned from the 2003 epidemic.

The urgent, often life-or-death needs of disaster victims tempt clinicians to pull out all stops, as it were, even when that may mean testing experimental procedures. In a third case commentary, Elizabeth Lee Daugherty and Douglas B. White from the

University of Pittsburgh and Johns Hopkins University, respectively, probe the question of postdisaster clinical research. Is it ethical, the case asks, to test emerging, non-FDA-approved treatments on victims of mass disaster?

Rounding off discussion of disaster response are a pair of educational manuscripts that highlight less-widely known aspects of clinical care for victims. Dana Sajed from New York University relates the history and use of point-of-care ultrasound in postdisaster scenarios, and Sadia Hussain from SUNY recaps the history and use of art therapy with survivors of disaster trauma.

A significant portion of the September issue is devoted to health policy and law. Joneigh S. Khaldun and Mathew Foley offer two views on the history and implications of the Turning Point Model State Public Health Act, which has served as a prototype for state laws that grant special powers to the governor and state assemblies during public health emergencies. DePaul University law student Ryan Bailey examines the post-Katrina case of Anna Pou, who remained with marooned patients in a New Orleans hospital during the devastating hurricane and was later indicted for giving them drugs that allegedly caused their deaths.

For the public, the medical, law, and policy concerns we have been enumerating are submerged by the deluge of media coverage. In her medicine and society essay, journalist Donna Rosene Leff focuses on just that, asking whether the sometimes very private and seemingly exploitive images that are published and broadcast can be justified on the basis of the public's need to know. Is it the duty of the press, she asks, to bear witness?

This issue can, of course, only sample the multitude of ethics questions embedded in every public health disaster, but it can raise critical topics and foster further discussion. We hope we have been effective in bringing these topics forward for your contemplation.

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CLINICAL CASE

Conducting Clinical Research during Disasters

Commentary by Elizabeth Lee Daugherty, MD, MPH, and Douglas B. White, MD, MA

On an early summer morning, a 7.8-magnitude earthquake devastated the northwestern United States. Homes and commercial dwellings were rendered uninhabitable, and the local medical infrastructure was overwhelmed with critically ill and injured patients. A large fire originating in a local warehouse spread to numerous surrounding structures, afflicting many workers with smoke exposure as well as acute lung injury (ALI) resulting from smoke inhalation (inhalational lung injury [ILI]).

Dr. Carl, a respected and accomplished critical care physician whose research is federally funded, responded with a non-governmental medical relief group, accompanied by a group of residents and fellows. Dr. Carl was selected to treat patients and direct an ICU erected on-site on the basis of expertise with ALI and previous disaster relief efforts.

Dr. Carl had pioneered a novel but still experimental approach for treating ILI using nebulized N-acetylcysteine and nebulized heparin (NAC-Hep). A major limitation to prior research was the small sample sizes of the studies, owing to the small number of ILI patients in the general population. These prior studies suggested that the NAC-Hep may decrease mortality and duration of mechanical ventilation.

Amidst the controlled chaos of the mobile ICU, Dr. Carl instituted NAC-Hep treatment in addition to standard ILI treatment in some, but not all, ILI patients. The fellows were instructed to keep more detailed records on the ILI patients than on other patients. A fellow with whom Dr. Carl had a good rapport expressed discomfort with participating in research that had not been approved by an investigational review board (IRB) and in which patients and patient surrogates had not given informed consent.

Dr. Carl professed not to know of any laws prohibiting conducting research under such circumstances and asserted that, by shortening ventilation times, their team might be able to treat and save more patients, and, moreover, the results of this project might have far-reaching implications for the treatment of ILI patients, possibly saving many more lives. Despite feeling morally conflicted, the fellow continued to treat patients as directed by Dr. Carl but questioned the ethics of this course of action and feared potential repercussions for involvement in the study.

Commentary

This case raises several important ethical questions. First, is it permissible to conduct experimental research on humans during a humanitarian crisis without IRB review? For both ethical and regulatory reasons, Dr. Carl's research should not be conducted without IRB approval. Although the situation created by this disaster seems to present a valuable opportunity for efficient study of a rare disease, it cannot come at the expense of the rights of potentially vulnerable subjects.

From an ethical perspective, research endeavors should be governed by the principles of respect for persons, beneficence, and justice [1]. IRB review provides a transparent, consistent way of ensuring these protections. These formal review processes also maintain public trust in human subjects research, which is crucial to its ongoing feasibility. Historically, unethical research practices have undermined the public trust on which the research enterprise is based [2-4].

From a regulatory perspective, the Common Rule requires all research conducted by institutions that receive federal funding (i.e. the majority of U.S. health care facilities) to undergo IRB review except in a limited set of carefully defined circumstances, such as research carried out on existing collections of data, research on educational strategies, and observation of public behavior, among others [5]. The research in the case presented clearly does not qualify for any of these exemptions.

A humanitarian crisis does not allow for the suspension of the ethical foundations governing human subjects research. A disaster such as an earthquake has the potential to leave overwhelming numbers of people homeless and financially devastated—the very definition of a vulnerable group. Federal regulations outline more—not fewer—research protections for such vulnerable populations [5]. The vulnerable status of the proposed subjects makes IRB review even more critical.

A second question raised by this case is whether it is permissible to conduct the research described without informed consent. Informed consent is a cornerstone of human subjects protection and is required in this case to ensure respect for individuals' bodily integrity and allow them to exercise their right to refuse unwanted interventions. Two exceptions to informed consent requirements may, at first glance, appear relevant to this case: the "impracticability" exception and the exception for emergency research. The impracticability exception allows research to proceed without informed consent when all of the following criteria are met:

1. The research involves only minimal risk;
2. The waiver of consent will not adversely impact the rights and welfare of subjects;
3. The research could not practically be carried out without waiver;
4. Subjects are provided with additional information after the fact [2].

For example, research using data in a national disease registry which records de-identified patient information and offers subjects the opportunity to opt out qualifies for such a waiver [6]. The research in question does not meet these criteria because the administration of an experimental therapy almost certainly poses more than minimal risk to the subject, and it is unclear that it would be feasible to provide

additional information to subjects after the trial given the chaos of the crisis. Importantly, even if the research in question were to meet criteria for a waiver, this determination must be made by an IRB, not the researcher.

A second situation in which research may be conducted without obtaining prior consent is “emergency research.” As with other exceptions to IRB review and informed consent requirements, the definition of emergency research is explicit and narrow. In order to qualify for a waiver of consent for emergency research, the researcher must demonstrate that:

1. Evidence supports a clear need for the research to be carried out and that the proposed participants are the only population that could reasonably participate;
2. Informed consent is not practical (e.g., the research subject is unconscious);
3. The risk-benefit assessment is favorable to the participants;
4. The community of potential participants has both input into the research design and conduct and hears about the results;
5. A data safety monitoring board is in place to provide ongoing review;
6. Due diligence is exercised to obtain consent from participant or proxy;
7. Proxy or participant assent or dissent after enrollment is respected;
8. The investigator has met with the FDA to discuss whether the study could be conducted without a waiver of consent [2].

Among the most frequently cited examples of emergency research are those involving cardiopulmonary resuscitation, in which therapy must be instituted immediately following a cardiac arrest in order to be effective, the patient is unable to give consent, and surrogates are often unavailable or unable to give meaningful consent [7]. The research in question does not meet these criteria. There has been no demonstration that the proposed participants are the only population that could reasonably participate—in fact, the case scenario suggests that other patient groups are able to participate and actually have participated; the potential participants (i.e., the disaster victims) have not been involved in, or even aware of, the research; and there is no evidence that due diligence is being exercised in seeking consent from proxies.

The question then remains: What should the fellows who are working with Dr. Carl do? Conducting the research described without IRB review is unethical and constitutes a “serious deviation from accepted research practice” [2]. If the fellows question the ethics of the research and these questions persist after their conversation with Dr. Carl, they should inform Dr. Carl’s superiors of their concerns. This type of reporting is an important part of research accountability, but can be challenging for those who, like the fellows in this case, are in positions of lesser power than those they would report. Reports of whistleblower harassment abound, and, with them, calls for improvements in whistleblower protections [8-12]. Given this reality, an alternative available at many institutions is confidential reporting to an ombudsman or the IRB. In either case, a confidential conversation with a more senior third party within the academic community can provide the fellows both with an advocate to assist in voicing their concerns and protection from possible retribution.

The fellows must also consider whether it is appropriate to treat the disaster victims with the experimental drug outside the context of a research protocol. This question highlights a key distinction between the ethics of the physician-patient relationship and those of the investigator-subject relationship. Physicians have a fiduciary duty to act for the good of their patients (with latitude to recommend treatments to patients based on their clinical judgment, as long as the treatment is within a reasonable standard of care and can be considered to be in the patient's best interest), but research occurs outside the context of a beneficence-based relationship, even when the investigator is a physician. The goal of research is the acquisition of generalizable knowledge and, for most research, there is not a clear expectation of benefit for the patient.

Valuable opportunities to advance scientific knowledge and improve the human condition do arise during humanitarian crises. Although the situation described does not justify setting aside foundational human subjects protections, it is possible that—with some creativity—the research could be conducted in a way that appropriately protects vulnerable subjects. One possible way to accomplish this is accelerated IRB review. IRB reviews often take weeks to months. For time-sensitive research during a humanitarian crisis, such delays can be prohibitive. In addressing research needs surrounding the H1N1 pandemic, Cook et al. cite the importance of developing procedural mechanisms to respond to the constraints raised by public health emergencies [13]. They recommend both emergency expedited IRB review for single-center H1N1 studies and a central IRB review process (e.g. regional, provincial, state or national) for multicenter H1N1 studies. Similar processes could be effectively adapted to disaster situations such as this one, allowing researchers to address both the requirement of patient autonomy and the need for expediency in crises.

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CLINICAL CASE

Mandated Influenza Vaccines and Health Care Workers' Autonomy

Commentary by Andrew C. Miller, MD, and David W. Ross, MD, JD

Dr. Ziad, a New York City physician, received a memo from her employer stating that, in accordance with a new hospital policy, she was required to receive both the seasonal influenza and novel H1N1 influenza vaccines. "Failure to comply by the specified deadline may result in disciplinary action," the memo said, "which could include termination of employment."

Dr. Ziad was concerned. She had, at times in the past, received the seasonal influenza vaccination, but had not planned to receive the H1N1 vaccine this season. It was her opinion that the H1N1 vaccine had been hastily prepared without appropriate clinical testing. Moreover, it seemed to her that the policy had a certain lack of regard for autonomy that she found very worrisome. She spoke to her departmental chairman to clarify the mandate and to express concern over the ethics and legality of such a policy. Dr. Ziad was informed that the policy stemmed from a September 2009 New York State mandate that all practicing physicians be vaccinated against both seasonal and H1N1 influenza [1]. He explained that the only exemption in this regulation was for cases of true medical contraindication. He emphasized that her failure to comply could result in termination of her hospital privileges or employment.

Dr. Ziad left the meeting dissatisfied and still unconvinced of the ethics of such a mandate. Did her ethical duties as a health care professional override her individual rights to determine her own health care?

Commentary

The concept of mandatory vaccination is a controversial topic in recent years. Annual influenza vaccination was first recommended for health care workers (HCWs) by the Advisory Committee on Immunization Practices in 1984 [2]. International guidelines recommend annual vaccination for all HCWs with patient contact, but worldwide rates of influenza immunization among HCWs remain low. In 2006, only 40 percent of U.S. HCWs were vaccinated against influenza [3]. It is generally accepted that vaccinating HCWs against influenza reduces nosocomial transmission and decreases staff illness and absenteeism [4]. The U.S. Department of Health and Human Services claims that HCW vaccination is the cornerstone of flu prevention [5]. Despite such assertions, the concept of mandatory HCW influenza vaccination remains under debate. This paper seeks to briefly address whether HCWs are ethically obligated to accept influenza vaccination.

A discussion of the legality of mandated vaccination is outside the scope of this brief discussion, but several principles of medical ethics can help in assessing whether such a mandate is ethical. At the start, the principles of beneficence and nonmaleficence can easily be applied to the mandatory vaccine scenario. Nonmaleficence, or the duty to “do no harm,” may be interpreted to mean that HCWs are duty-bound not to place patients at undue risk [4]. Applied to influenza vaccination, this principle suggests that patients have the right to expect that their hospital will take every reasonable precaution to protect them from developing nosocomial illness [6]. For this reason, one may argue that HCWs are ethically bound to accept influenza vaccination [4].

Beneficence requires HCWs to do more than simply avoid harming patients; it requires them to act in their patients’ best interest. Understood broadly, this includes both the provision of beneficial medical interventions and a duty to take reasonable steps to ensure good outcomes for their patients. According to this definition, beneficence can be construed to demand that HCWs receive influenza vaccination annually because doing so would offer them greater immunity and increase their capacity to provide care during influenza outbreaks [4].

On the basis of these medical ethics principles, HCWs would seem to have a duty to accept influenza vaccination. As with any ethical dilemma, however, there are opposing views. Opponents of mandatory HCW influenza vaccination cite many reasons for their stance. Commonly reported reasons include religious objection, philosophical or intellectual objection, medical contraindication, rare but potentially serious medical risks (e.g., Guillain-Barre Syndrome), time constraints, and perceived low risk of infection [4, 7].

The most compelling argument is grounded in a third principle of medical ethics: respect for individual rights and autonomy. It is generally accepted that competent adults have the right to make their own health care decisions, including the right to accept or decline medical intervention. Compulsion is reserved for situations in which people are considered incapable of doing so (e.g., minors, comatose patients, incompetent individuals) or in which there is an imminent and serious danger to others (e.g., an individual has a virulent, contagious disease like tuberculosis or small pox). Neither of these conditions for compelling treatment is met in the case of influenza vaccination. HCWs have decision-making competency, and, absent an established infection, it is difficult to make the case that an individual HCW poses an imminent threat to the safety of others. The case for compelling vaccination is particularly hard to make given that overall vaccination rates among the public do not approach levels necessary to achieve herd immunity [8, 9].

We should also look at a World Health Organization (WHO) report on ethical public health responses to influenza pandemic, which proposes some principles that might restrain mandated vaccination [10]. Individual human rights and civil liberties may have to be limited in emergency situations in the public interest, the report says, but “measures that limit individual rights and civil liberties must be necessary,

reasonable, proportional, equitable, non-discriminatory, and in full compliance with national and international laws” [10].

The principles of “necessity” and “reasonableness” are difficult to satisfy in the case of mandated vaccination. As highlighted by a Cochrane analysis, the evidence on whether HCW influenza vaccination benefits patients has been surprisingly inconclusive [8, 11]. Even if such programs were able to achieve 100 percent vaccination rates amongst HCWs, it is unclear how this would impact patient outcomes or community influenza rates. Health care settings are not the primary context for influenza transmission, and, without significant vaccination rates among the general population, it is unlikely that mandatory vaccination of HCWs would significantly alter influenza rates in the general population. Moreover, the goal of influenza vaccination has never been to induce herd immunity and thus community protection, but rather it has been to protect individual at-risk persons [9].

Mandatory vaccination is a controversial strategy that pits HCWs’ autonomy against their professional duty to promote patient safety [2]. Employer or governmental mandates that lack an opt-out policy may be seen as coercive and invasive, especially if linked to sanctions including employment loss [4]. And the need for coercive action is not supported by epidemiologic evidence. Mandated vaccination may damage workplace relationships and alienate employees. Moreover, there must be recourse of some sort for those HCWs who would suffer harm from mandated vaccination (e.g., those with Guillain-Barre syndrome, allergic reactions).

Thus, noncompulsory programs seem preferable to compulsory programs. Purely voluntary programs, however, have traditionally yielded modest results [2, 12, 13]. A noncompulsory but opt-out program (rather than the traditional opt-in) may be more successful in increasing participation while meeting the health care system’s duties of nonmaleficence and beneficence and, at the same time, respecting individual autonomy. An analogous change in approach has succeeded in boosting organ donation rates in some European countries [14]. In addition to the change to an opt-out system, incentive programs could be implemented to improve clinician participation.

There is a legal precedent for mandating vaccination in public health crises with high morbidity and mortality rates. In *Jacobson v. Massachusetts* (1905) during a smallpox epidemic in Cambridge, Massachusetts [15], the court ruled that the police power of state included reasonable regulations established by legislature to protect public health and safety, specifying that the state could require vaccination if the Board of Health deemed it necessary for public health or safety [15]. This case has subsequently been upheld on numerous occasions.

From an ethics standpoint, comparing issues arising from a largely untreatable and almost universally deadly early 20th-century smallpox epidemic to a 21st-century influenza epidemic is akin to comparing apples to oranges. (Such comparisons may be more apropos if an effective HIV vaccination were to become available, a hoped-

for possibility that, in our opinion, should be discussed in anticipation of its occurrence.)

Influenza vaccine mandates should be evaluated on their own merits. Analysis based on the primary principles of beneficence and nonmaleficence suggests that HCWs have a duty to accept influenza vaccination provided that medical contraindication or religious obligation do not preclude such action. Respect for the rights of individuals—including health care workers—to exercise autonomy in health care decisions argues for allowing HCWs to refuse vaccination. The WHO tests of necessity and reasonableness support the latter conclusion. Do professional obligations to protect patients from harm and act in their best interest outweigh HCWs' right to refuse treatment? Because that judgment is so individual and difficult to make, opt-out vaccination programs seem preferable to mandated vaccination.

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CLINICAL CASE

The Patient-Physician Relationship in Quarantine

Commentary by Nikita Joshi, MD, and Bonnie Arquilla, MD

Dr. Lee was a physician in a large urban medical center in New York. He received notification from his institution's director of disaster preparedness that a transatlantic flight originating in Asia had been diverted over concern of a passenger's displaying symptoms of severe acute respiratory syndrome (SARS), a highly contagious and potentially life-threatening airborne infection caused by the SARS-associated coronavirus (SARS-CoV). Upon landing in New York City, all passengers were transported to Dr. Lee's medical facility and placed under mandatory quarantine. In accord with Centers for Disease Control and Prevention (CDC) guidelines, exposed individuals would remain in quarantine for up to 10 days after the most recent patient's development of symptoms. Following the hospital's disaster preparedness protocol, Dr. Lee reported for duty to the designated quarantine ward.

Among the 57 passengers under quarantine was a 28-year-old man, Joshua, who was returning from his temporary residence in Hong Kong for the purpose of donating bone marrow for his younger brother with advanced leukemia. Joshua was the only living donor match identified for his brother; he insisted that he must be allowed to leave for that purpose. He was not released and remained under mandatory quarantine. Over the subsequent days, Joshua spent much of his time coordinating a donation schedule to correspond with his expected release from quarantine.

On the morning of the tenth day, an elderly patient with diabetes developed a cough with mild dyspnea. She admitted she had been experiencing myalgias and subjective fever for 2 days, but had not alerted the staff for fear of extending quarantine. The newly symptomatic woman was removed from the general quarantine population, and those quarantined were informed of the new 10-day extension. Joshua pleaded with Dr. Lee to release him so that he could provide a life-saving bone marrow donation to his only brother.

Commentary

The issue at hand is whether an individual who is quarantined by a public health official may leave for any reason. To answer this question, we must consider how quarantine works. According to the CDC Web site, quarantine may be used to separate from the general population and restrict the movements of people who have potential exposure to infectious diseases (e.g., cholera, tuberculosis, smallpox, viral hemorrhagic fevers, SARS, pandemic influenza). Quarantine separates seemingly asymptomatic people from the general public because, though they appear healthy, they may in fact be infected and capable of exposing others to the disease. Isolation is the practice of separating actively ill people from those who are healthy [1].

The federal government (more specifically, the secretary for Health and Human Services, aided by the CDC) was given the authority to impose isolation and quarantine by the Commerce Clause of the Public Health Service Act, which confers the authority to regulate foreign and interstate commerce and includes the authority to act to prevent the spread of infectious processes. Individual states also have responsibility and authority to control the spread of disease within their borders, and the 10th Amendment gives them the ability to enforce isolation and quarantine. States may also have individual laws addressing isolation and quarantine to protect the health of their citizens [1].

In short, Dr. Lee is not in a position to decide to break quarantine. No individual has the authority to break quarantine without consulting the local and state public health departments, regardless of the cause. The only circumstance that would make it acceptable to break quarantine is if the life of a quarantined person were threatened—for example, if the patient required lifesaving techniques.

Safeguards are in place, however, to ensure that personal liberty is not violated in the course of protecting the public from infectious diseases. For example, the New York City Board of Health ensures that

individuals who are detained for a period of less than three business days are provided with an opportunity to be heard and to have their individual circumstances assessed. Those detained for a longer period may require the Department to seek a court order within three business days. The Department then must obtain a court order within sixty days, even if the detained individual has not requested release.... Notice of the detainee's rights is provided to each detainee in writing. For individuals detained for more than three (3) business days, this includes the right to be represented by an attorney provided by the City of New York [2].

Within the legal constraints, Dr. Lee's first ethical duty is to mitigate the situation for Joshua. Although Dr. Lee is charged by the hospital's protocol and by law to administer the quarantine, he is still responsible for the individual patients' well-being and may find that it is necessary to advocate for them. Although Joshua is not manifesting symptoms of the disease, he is still Dr. Lee's patient, and Dr. Lee has a responsibility to look after his all-around well-being, not just his physical health.

As in any situation where patients seek information and advice from their physicians, Joshua may not know what his options are or how to go about taking advantage of them. Dr. Lee should inform him of his rights—both those detailed above and his right to convene the hospital's ethics committee. Because Dr. Lee does not have decision-making authority in the hearing, he is not compromising the health or safety of the general population by letting Joshua know his rights. Moreover, whether or not Dr. Lee thinks it would be dangerous for Joshua to leave quarantine, information must not be withheld from the patient to serve the interests of the general population.

Dr. Lee should also help Joshua plan for the possibility of quarantine extension and look for additional donors in the event it has to be enforced. He can contact the brother's doctors to inform them of Joshua's status, and they can work together to conduct bone marrow drives in order to seek out another donor. As a physician, Dr. Lee's first responsibility is to be an advocate for his patients. This does not mean breaking the law or putting society at risk, but seeking solutions that will be beneficial for all involved.

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MEDICAL EDUCATION

Disaster Medicine and Emergency Preparedness Training for Health Care Institutions

John Broach, MD, MPH, Mary-Elise Manuell, MD, MA, and Andrew Milsten, MD, MA

The Center of Excellence in Emergency Preparedness Education and Training (CEEPET) at the University of Massachusetts Medical School recently produced a curriculum development model to address the disaster medicine and emergency preparedness training needs of central and western Massachusetts. The center is funded by a grant from the Massachusetts Department of Public Health Emergency Preparedness Bureau, which identified several competency areas the curriculum should be designed to emphasize. These are the incident command system, hazardous materials and decontamination training, risk communication, updating and revision of continuity of operations (COOP) and emergency operations plans (EOP), and emergency planning for at-risk populations.

CEEPET's mission is to provide competency-based emergency preparedness education and training, using an all-hazards approach, to staff members of hospitals, community health centers, long term care facilities, and emergency medical service providers.

Needs Assessment

We anticipate there will be considerable variability in needs both within and among the four target training groups. The goals of the needs-assessment process are to identify these individual needs and to enroll each stakeholder organization in ongoing curriculum development. To collect initial data about the specific training needs of each facility, an online survey was distributed, asking about types of training needed and how many staff members each facility would be training. Survey results, supplemented by an ongoing dialogue with our stakeholders as training needs develop, will form the basis for curriculum development.

Curriculum Development Process

The CEEPET curriculum development process is based on Ralph Tyler's four key curriculum development steps: defining goals, establishing corresponding learning objectives, organizing learning objectives to have a cumulative effect, and evaluating outcomes [1]. The advantage of this approach, especially in disaster medicine and emergency management training, is that course content can be adapted to each target audience's learning objectives. We believe that developing specific curriculum for as many different audiences as possible strengthens community resilience and preparedness.

A look at each of these steps illustrates how the center will develop audience-specific content.

Define goals. Hospitals, long-term care facilities, community health centers, and EMS providers all have different regulatory requirements and self-identified needs for emergency management training. To include as much flexibility in our curriculum development process as possible, the training center invites leaders of these stakeholder organizations to attend the bimonthly meetings of the curriculum development committee.

Establish corresponding learning objectives. The educational goals of the center will be updated and revised on an ongoing basis. The director of curriculum development and subject matter experts will develop a list of audience-specific learning objectives for each educational goal. These objectives will guide course development and evaluation.

Organize learning objectives to have a cumulative effect. To create a curriculum that builds on itself and continually reinforces core principles of emergency management and disaster medicine, the training center will adapt Jerome Bruner's concept of the "spiral" curriculum [2, 3], which suggests that returning to key topics, broadening and deepening them with each return or "spiral," reinforces the learner's understanding of how that topic fits into the core concept. This approach will allow us not only to build a common scaffolding for all emergency management course work, but also to emphasize the importance of each specific course in the overall discipline. Key topics will include incident command systems, the disaster cycle, and the National Incident Management System. Emergency management is well served by the spiral approach because effective disaster management depends upon the ability of professionals from a variety of disciplines to coordinate their efforts in times of crisis. Giving trainees a common foundation will, we hope, improve that cooperation in actual emergency response.

Evaluate outcomes. Participants' feedback will be solicited after each course and all courses will be evaluated quarterly and improved, based on this feedback. The learning-objective-based evaluation of each course will assess the value of the course material to the learner's overall understanding of emergency management.

Conclusions

This curriculum development process has been designed to highlight the fundamentals of emergency response while allowing maximum flexibility and input from our stakeholders and trainees. We believe that the four-step approach is a useful model that can be adapted to many other locations and needs. In addition, the "spiraling" technique is particularly suited to emergency management, emphasizing standardization of disaster management education and enhancing the ability of trainees from various disciplines to work together.

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THE CODE SAYS

The AMA *Code of Medical Ethics*' Opinions on Quarantine and Physician Duty to Treat

Opinion 2.25 – The Use of Quarantine and Isolation as Public Health Interventions

Quarantine and isolation to protect the population's health potentially conflict with the individual rights of liberty and self-determination. The medical profession, in collaboration with public health colleagues, must take an active role in ensuring that those interventions are based on science and are applied according to certain ethical considerations.

1. To this end, the medical profession should:
 - A. seek an appropriate balance of public needs and individual restraints so that quarantine and isolation use the least restrictive measures available that will minimize negative effects on the community through disease control while providing protections for individual rights;
 - B. help ensure that quarantine and isolation are based upon valid science and do not arbitrarily target socioeconomic, racial, or ethnic groups;
 - C. advocate for the highest possible level of confidentiality of personal health information whenever clinical information is transmitted in the context of public health reporting;
 - D. advocate for access to public health services to ensure timely detection of risks and prevent undue delays in the implementation of quarantine and isolation;
 - E. help to educate patients and the public about quarantine and isolation through the development of educational materials and participation in educational programs;
 - F. advocate for the availability of protective and preventive measures for physicians and others caring for patients with communicable diseases.
2. Individual physicians should participate in the implementation of appropriate quarantine and isolation measures as part of their obligation to provide medical care during epidemics (see Opinion E-9.067, "Physician Obligation in Disaster Preparedness and Response"). In doing so, advocacy for their individual patients' best interests remains paramount (see Opinion E-10.015, "The Patient-Physician Relationship"). Accordingly, physicians should:
 - A. encourage patients to adhere voluntarily to scientifically grounded quarantine and isolation measures by educating them about the nature of the threat to public health, the potential harm that it poses to the patient and others, and the personal and public benefits to be derived from quarantine or isolation. If the patient fails to comply voluntarily with such measures, the physician

- should support mandatory quarantine and isolation for the non-compliant patient;
- B. comply with mandatory reporting requirements and inform patients of such reports;
 - C. minimize the risk of transmitting infectious diseases from physician to patient and ensure that they remain available to provide necessary medical services by using appropriate protective and preventive measures, seeking medical evaluation and treatment if they suspect themselves to be infected, and adhering to mandated public health measures.
3. Frontline physicians have an increased ethical obligation to avail themselves of safe and effective protective and preventive measures (for example, influenza vaccine).

Opinion issued in June 2006 based on the report “[The Use of Quarantine and Isolation as Public Health Interventions.](#)”

Opinion 9.067 – Physician Obligation in Disaster Preparedness and Response

National, regional, and local responses to epidemics, terrorist attacks, and other disasters require extensive involvement of physicians. 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. The physician workforce, however, is not an unlimited resource; therefore, when participating in disaster responses, physicians should balance immediate benefits to individual patients with ability to care for patients in the future.

In preparing for epidemics, terrorist attacks, and other disasters, physicians as a profession must provide medical expertise and work with others to develop public health policies that are designed to improve the effectiveness and availability of medical care during such events. These policies must be based on sound science and respect for patients. Physicians also must advocate for and, when appropriate, participate in the conduct of ethically sound biomedical research to inform these policy decisions. Moreover, individual physicians should take appropriate advance measures to ensure their ability to provide medical services at the time of disasters, including the acquisition and maintenance of relevant knowledge.

Based on the report [Physician Obligation in Disaster Preparedness and Response](#), adopted June 2004.

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CLINICAL PEARL

Severe Acute Respiratory Syndrome (SARS)—Lessons for Future Pandemics

Adriel Malave, MD, and Elamin M. Elamin, MD

Background

From November 2002 to July 2003, worldwide attention turned to cases of a rapidly progressive respiratory illness that spread through five continents. The regions most affected were Guangdong Province in China, Hong Kong, Vietnam, Singapore, and Canada [1-3]. The illness was eventually named severe acute respiratory syndrome (SARS) by the World Health Organization (WHO), which launched major efforts to track cases, determine an etiology, establish a laboratory test for diagnosis, evaluate treatments, and test infection control strategies to prevent further spread. There were 8,447 cases—21 percent occurring in health care workers (HCWs)—and 813 deaths (9.6 percent overall mortality) by the time SARS was contained in July 2003 [4]. The case-fatality rate in 2003 was estimated at 13.2 percent for patients younger than 60 years and 50 percent for patients older than 60. Fifty percent of patients with SARS-related acute respiratory distress syndrome (ARDS) died [4].

Epidemiology

SARS was first reported in Guangdong Province, China in November 2002. Health care workers and their contacts—those who care for, live with, or have face-to-face contact with them, which confers a high likelihood of direct contact with respiratory secretions and other bodily fluids—appeared to be a major factor in the outbreak [4]. The initial case was a physician from Guangdong who traveled to Hong Kong to visit family 5 days after the onset of some symptoms [5]. Other cases in Hong Kong developed in people who had some contact with the index or secondary cases, including guests staying at the same hotel as the initial case. The infection was spread to Singapore, Thailand, Vietnam, and Canada by travelers returning from Guangdong province and Hong Kong. In Toronto, a couple returning from Hong Kong were considered the index cases; the disease seems to have been spread by HCWs and patients in the institution where they were treated, and then spread further when some of those patients were transferred to other hospitals, before the Canadian medical community was aware of SARS. An outbreak of other strains of SARS-CoV, mainly among individuals with frequent animal contacts, was reported in Guangdong in late 2003 and early 2004 [6].

Adults were primarily affected in both outbreaks [7]. In the pediatric population, the clinical course was described as mild or brief with nonspecific laboratory abnormalities (e.g., lymphopenia, elevated transaminases and creatine kinase) and chest imaging changes; no pediatric mortalities were reported [4].

Etiology

Speculations about the etiology of this illness favored a new strain from the coronavirus family of viruses, due to the symptom complex and pattern of contagion. Two independent studies have demonstrated infection of a relatively high percentage of horseshoe bats in China with viruses that have nucleotide sequences nearly identical to SARS [8, 9]. Furthermore, genome sequencing has demonstrated that bat SARS-like viruses and SARS isolates from humans share 88 to 92 percent of their overall sequence identity [10], which raises the possibility that bats could be a primary reservoir [11]. Further molecular studies separated the human SARS-CoV isolates into early-, middle-, and late-phase outbreak viruses. Interestingly, human SARS-CoV isolates from 2003-2004 were more closely related to animal isolates than human isolates from 2002-2003. Such findings suggest an “independent species-crossing” event [4].

Transmission

Based upon the case clusters from Hong Kong and Canada, SARS appears to spread from person to person and through face-to-face contact, suggesting droplet spread [5, 12, 13]. During the Hong Kong outbreak, for example, almost one-half of patients were infected in clinics, hospitals, or nursing homes, most likely through small droplets that remain suspended in the air [14-16].

SARS-virus RNA was detected on a variety of hospital surfaces, including computer mice and elevator handrails, during the outbreaks [17]. This can be explained by the excretion of coronavirus in sputum, which can remain in the environment for up to 21 days, and vomit [18]. Other possible transmission vectors are sewage and water, because SARS virus can be excreted in stool for several weeks after symptoms have resolved [18, 19].

Clinical Presentation

SARS-CoV disease can be similar to other viral illnesses. During the first week, patients can have influenza-like symptoms that include fever, rigors, headache, malaise, and myalgias. During the second week of illness, respiratory symptoms, such as dry cough and dyspnea, may emerge, in addition to diarrhea. During this time, respiratory distress can rapidly progress to full-blown pneumonia, leading to respiratory failure. Up to 70 percent of patients develop large volume watery diarrhea [20].

The WHO and the U.S. *Centers for Disease Control* and Prevention (CDC) issued separate, but similar, definitions for SARS [20, 21]. According to the WHO, a probable case is defined by

- Fever above 38 degrees C (100.5 degrees F), plus
- One or more lower respiratory tract symptoms (cough, dyspnea), plus
- chest radiograph findings of pneumonia or acute respiratory distress syndrome (ARDS), and

- No other cause for acute illness and respiratory failure [20].

The CDC outlines laboratory criteria in its definition [22].

Laboratory and Imaging

Among the laboratory tests for SARS are SARS-CoV diagnostic assay by reverse transcription-polymerase chain reaction (RT-PCR) and seroconversion by ELISA. A single positive test does not confirm diagnosis, given their high rates of false positives and negatives. Thus, RT-PCR is usually done first and, when positive, ELISA is used to confirm results. Further confirmation can be carried out in reference laboratories by testing for serum antibodies to SARS-CoV: a four-fold or greater increase in antibody titer in two clinical specimens from different sources *or* the same source on two different days confirms the SARS diagnosis.

SARS diagnosis can be excluded if another diagnosis fully explains the illness, if the case was classified based upon an exposure to another patient who is subsequently found not to have SARS, or if a convalescent serum sample obtained less than 28 days after the onset of symptoms proves to be negative for antibodies to the SARS virus [20, 21]. Overall, the viral culture sensitivity to confirm a SARS diagnosis is lower than that of other serologic tests [21].

Predictors of Outcome

Nonspecific laboratory abnormalities that may be observed with SARS include elevated serum aminotransferases and creatine kinase reported early in the course of the disease, with leukopenia and thrombocytopenia as the respiratory phase peaks [7]. Elevated lactate dehydrogenase was reported in 71 percent of 138 patients in a case series from Hong Kong [23] and appears to be associated with a poor outcome. [24, 25].

Chest x-ray patterns range from normal to diffuse interstitial infiltrates characteristic of ARDS [26-29]. Computed tomographic (CT) scan images may show parenchymal abnormalities in patients with seemingly normal chest x-rays [30-32]. Small (less than 1 cm in diameter) cysts are common in advanced disease, and both pneumothorax and pneumomediastinum have been reported [33, 34]. These findings are not specific and can be seen in other viral and bacterial respiratory diseases, but they are useful for guiding treatment.

Treatment

The mainstay of treatment is supportive care [35]. Antibiotics are ineffective. Several antiviral agents, including ribavirin, have been tried, but the efficacy of these drugs has not been established [3, 12, 36-39]. In the retrospective series of 144 cases from Toronto, there was a trend toward a worse outcome in patients who had received ribavirin [4]. Most reported treatment regimens have also included corticosteroids, but there is no evidence of their efficacy.

Prevention

The severity of SARS and its rapid spread highlighted the need for swift and drastic preventive methods. To a great extent, we may consider the large-scale response to the H1N1 influenza pandemic to be reflective of lessons learned from the SARS pandemic.

The WHO issued its first ever travel advisory against nonessential travel to Guangdong Province, China, and Hong Kong in April of 2003—a decision that was quickly supported by the CDC, who even broadened the restricted area and cautioned travelers to Toronto to avoid hospitals or other places in which SARS was likely to be transmitted. The CDC also advised travelers to carry materials for personal protection, such as surgical masks or alcohol-based hand rubs [20, 21]. By late June and early July 2003, the number of SARS cases worldwide had decreased through voluntary quarantines and strict infection control measures, and the WHO began lifting its travel advisories.

For any future outbreaks of SARS or similar respiratory illness, it will be imperative to isolate hospitalized patients in negative pressure rooms, which draw air in (rather than letting it out) when opened, helping to control contagion. Since the past outbreak was spread by HCWs, infection control measures, such as droplet precautions, are of particular importance [4, 20, 21]. HCWs and visitors should wear surgical masks to prevent airborne and droplet acquisition; these can be discarded into the nonregulated waste stream if they do not have blood or bodily fluids on them [4, 20-21]. Furthermore, HCWs should be barred from work if they develop fever or respiratory symptoms within 10 days of exposure to SARS [20, 21] and should remain on sick leave for a full 10 days after fever and respiratory symptoms have resolved. However, HCWs are not advised to remain home during the 10-day incubation period for SARS if they have no symptoms.

For individuals with suspected SARS, the most important element of community infection control, according to the CDC, is to remain at home for a full 10 days after fever and symptoms resolve [21]. Meanwhile, household contacts of the patient should practice strict hand washing and use gloves for contact with bodily fluids [20, 21], utensils and bedding should not be shared without proper washing, and surgical masks should be considered for close contact between SARS patients and uninfected contacts. Like HCWs' contacts, those of SARS patients may leave the home as long as they are asymptomatic.

Conclusion

Health care institutions worldwide face a major challenge should SARS re-emerge, the risk of which is heightened by its similarities to other coronavirus strains of animal origin and the fact that it persists within animal reservoirs. They will have to confront emergency department overcrowding, increased sick call amongst staff, strict implementation of infection control measures, and the need to rapidly educate the general public to avoid a worldwide panic. History has shown us that coordinated leadership, improved communication among health care organizations, investment in

preventive measures infrastructure, and modification of critical care services are essential to mitigating the effects of future outbreak [40].

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HEALTH LAW

The Case of Dr. Anna Pou—Physician Liability in Emergency Situations

Ryan Bailey

The floodwaters of Hurricane Katrina marooned Anna Pou, MD, and the rest of the Memorial Medical Center staff in Uptown New Orleans in August 2005. The storm knocked out the hospital's power and running water and sent the temperatures inside soaring above 100 degrees. The hospital's backup generators survived the storm, but the following morning floodwaters from the sewers began to creep up, threatening to reach the hospital's emergency-power transfer switches located a few feet above the ground [1].

The physicians working at the hospital got together and established an evacuation plan to be implemented if the hospital's backup generators failed before rescue workers reached them. The 52 patients at LifeCare, a long-term, acute care facility for the elderly patients with multiple medical problems, which was located in the hospital but administered separately, were not taken into account. At the time, the evacuation plan did not appear to be of extreme importance, because rescue workers were expected to evacuate the entire hospital in a few hours. That, however, did not happen.

The Evacuation Process

A crew of doctors, nurses, and family members began carrying patients to the only working elevator on the second floor, which took patients to the rooftop level of the parking garage. Each patient was then put on a stretcher and maneuvered through a 3-by-3-foot hole in a machine room wall and out to the helicopter pad, where rescue workers and the Coast Guard took over.

By nightfall, the Memorial staff had gotten their patient count down from about 180 to around 130. There was an opportunity to evacuate more patients later in the night, but the staff needed rest and the helipad was not particularly safe after dark. LifeCare's administrators were working to secure evacuation assistance for their patients, which, it was hoped, would come in the morning. However, in the middle of the night, about 48 hours after Katrina first struck, the comforting hum of the backup generators stopped—killing the elevator and the remaining power. In LifeCare on the seventh floor, critically ill patients began suffering the consequences as the machines on which they relied, such as ventilators forcing air into their lungs, switched to battery reserves and soon sputtered out, at which point it appeared that the Coast Guard could evacuate a few very critical patients if they were brought immediately to the helipad.

By this time, the staff had been on duty for at least 2 days with little sleep and inadequate food and water. Undeterred, volunteers and staff carried LifeCare patients up many flights of stairs in the dark with hopes of getting as many patients as possible to the helipad. Other nurses and volunteers used Ambu bags to squeeze air into patients' lungs until their arms cramped from the effort.

Still, critical patients began to die because there was not enough oxygen or manpower to save them all. The doctors had to make a triage decision. They carried 100 or so patients, not including the remaining LifeCare patients on the seventh floor, to the first floor and assigned each a number—1, 2, or 3—based on his or her status; 1s were to be evacuated first, 3s last.

The 1s were moved to the emergency room, where a group of rescue boats had arrived after sunrise, when daylight made water transportation possible. The 2s were placed in a line along the corridor leading to the hole to the helipad. The 3s were moved to a corner to wait.

When government rescue operations shifted to others trapped on rooftops throughout the city, Coast Guard helicopters began arriving less and less frequently at Memorial Hospital. By now most of the ICU and LifeCare patients had been evacuated, and those who remained were in critical condition. LifeCare patients, because they were still on the seventh and eighth floors and had not been moved to the emergency room, would have to be carried long distances to be evacuated. The heat was rising and resources were scarce. Staff was tiring from the unrelenting climbing of stairs and carrying of patients.

As the hours passed, it became clear to the doctors that they would not be able to evacuate some of the LifeCare patients. Without machinery to stabilize the patients and adequate transportation to move them to evacuation sites, it seemed likely that some would not survive. After more than 72 hours, some physicians, including Dr. Pou, decided to sedate some of the LifeCare and category 3 patients with injections of morphine and midazolam. Dr. Pou stated her intention was to “help the patients that were having pain and sedate the patients who were anxious” because she “knew they were going to be there another day, that they would go through at least another day of hell.”

After 4 days of what Dr. Pou described as “hell,” the hospital was finally empty of all surviving patients and staff. Yet, 45 decomposing corpses were eventually removed from the hospital, many more than were found at any other comparable hospital in the flooded city. This sparked an investigation that led to the arrest of Dr. Pou and the nurses connected to the deaths of four patients.

The Investigation

The Louisiana attorney general, Charles Foti, Jr., opened investigations into hospital and nursing home deaths citywide. A LifeCare lawyer alerted the attorney general to nine alleged cases of euthanasia at Memorial. A coroner was hired to determine the

patients' cause of death through autopsies. The coroner detected morphine in all nine bodies. Next, the attorney general's office hired a forensic pathologist to review the toxicology reports of four of these nine patients. The forensic pathologist concluded that all four deaths were homicide, caused by human intervention. About a year after the storm, Dr. Pou was arrested and charged with one count of second-degree murder and nine counts of conspiracy to commit second-degree murder.

Regulations that Apply to Physicians in Emergencies

None of the federal regulations that outline the standard of care and provide for physician liability protection in emergency situations apply to Dr. Pou. Under the federal Emergency Medical Treatment and Active Labor Act (EMTALA), Medicare- and Medicaid-funded hospitals with emergency rooms must screen all persons coming to the emergency department to determine whether they have medical conditions requiring immediate or urgent care [2]. When they do, the hospital staff must either stabilize or transfer the patient to a facility that is willing and able to provide appropriate treatment. EMTALA does not apply to Dr. Pou because those for whom she was caring were admitted patients—inpatients—not emergency room arrivals.

Nor does another federal regulation match Dr. Pou's circumstances. The Volunteer Protection Act of 1997 (VPA) provides certain immunities to volunteer health care workers in emergencies and public health epidemics, but it does not apply because Dr. Pou was not volunteering; she was a staff physician [3].

Louisiana's Good Samaritan laws, which remove liability for any civil damages resulting from a physician who "in good faith gratuitously rendered emergency care or services at the scene of an emergency" or a physician "who in good faith responds to an imminent life threatening situation or emergency within the hospital or facility and whose actual duty in the hospital or facility did not require a response to an emergency situation," do not apply to on-duty staff physicians [4].

Dr. Pou, however, is subject to another Louisiana state law, based on a model federal statute, which provides immunity for physicians working in emergency situations. In December 2001, the Centers for Disease Control (CDC) released the Model State Emergency Health Powers Act (MSEHPA), which includes provisions intended to ensure the development of comprehensive plans for emergencies, facilitate early emergency detection, and grant state and local officials powers in order to handle emergencies [5]. As of July 15, 2006, MSEHPA was introduced in whole or part in 44 states and the District of Columbia. Thirty-eight states passed bills or resolutions that include provisions closely related to the act [6]. Louisiana is one of these states.

The Health Emergency Powers Act that Louisiana passed in 2003 contained language stating that "during a state of public health emergency, any health care providers shall not be civilly liable for causing the death of, or injury to, any person...except in the event of gross negligence or willful misconduct" [7]. In Louisiana, "gross negligence" has been defined as the "want of even slight care and

diligence” and the “want of that diligence which even careless men are accustomed to exercise” [8]. Generally speaking, the term “willful misconduct” refers to conduct undertaken by one who knows she is committing or intends wrongdoing.

Under the applicable state statute, then, Dr. Pou must have acted either with “gross negligence or willful misconduct” or in “bad faith” to be civilly liable for the deaths of her patients at Memorial.

The Brief Prosecution of Dr. Pou

The Louisiana attorney general charged Dr. Pou, and, after a review of the evidence and testimony from Memorial staff, the grand jury decided not to indict her, eliminating the possibility of finding her guilty in criminal proceedings. Three civil suits naming Dr. Pou as the defendant, however, are pending in Louisiana state court. Dr. Pou has filed a brief with the Louisiana Supreme Court opposing the release of a 50,000-page file assembled by investigators on deaths at Memorial, so little information about the current proceedings is available [1].

The Support for Dr. Pou

As evident in the grand jury’s decision not to indict her, Dr. Pou has numerous supporters who consider her decision heroic. Rather than abandon patients, she remained at the hospital with them for 4 days without adequate sleep, food, water, resources, or manpower. According to the American Medical Association’s *Code of Medical Ethics*, “Individual physicians have an obligation to provide urgent medical care during disasters” that “holds even in the face of greater than usual risks to their own safety, health or life” [9]. It is not speculation to state that Dr. Pou and the Memorial staff put their own health and safety at risk in the atrocious post-Katrina environment and successfully evacuated the majority of Memorial’s patients despite life-threatening conditions. The AMA has commended Dr. Pou for her efforts, and the chair of its board of trustees, Edward L. Langston, MD, stated, “We believe these physicians served as bright lights during New Orleans’ darkest hour” [10].

The pending civil suits will eventually be resolved and the remaining questions about Dr. Pou’s legal liability will be answered. But exactly what happened over those 4 harrowing days at Memorial may never be fully known.

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POLICY FORUM

In Context—The Turning Point Model State Public Health Act

Joneigh S. Khaldun, MD

The Need for the MSPHA

The H1N1 influenza epidemic of 2009 strained the American health care system. During this time, a highly communicable virus swept the nation, placing seemingly insurmountable burdens on already overcrowded and financially strapped hospitals. Accurate, timely communication between government and hospital authorities was critical, as were frequent updates to the public through media outlets. Physicians looked to the Centers for Disease Control and Prevention for ever-evolving screening, prophylaxis, and treatment guidelines. New governmental policies were developed and instituted. New York State, for example, mandated the vaccination of all health care workers against H1N1. This mandate was ultimately suspended largely due to lack of vaccine availability, but it demonstrates the effect that such epidemics may have on both health care delivery and public health policy [1].

Who has the authority to draft and enforce such legislation? Do individuals have the right to refuse mandated treatment, and, if so, what procedures are in place to acknowledge these rights without compromising the public's health? Few will deny society's responsibility to protect and maintain the public's health. Public health law, "the study of the legal powers of the state to ensure the conditions of people to be healthy," is essential in this function, because it structures the circumstances in which states and public health agencies provide services [2]. Unfortunately, not until unexpected disasters, biological threats, or infectious disease epidemics surface are the shortcomings of public health laws revealed; states are often left scrambling to develop legislation and policies as the situation evolves. Public health legislation varies state to state and is often outdated or not readily applicable to emerging outbreaks or contemporary chronic diseases [3, 4]. For example, one state's legal quarantine authority is defined only for specific diseases, such as tuberculosis; during the SARS epidemic of 2003, new policy had to be instituted to expand that legal authority to include SARS [4, 5]. Furthermore, designations of legislative authority are generally vague, and policies do not reflect updated constitutional and ethical norms safeguarding individual rights and privacy [3, 4, 6]. One state's legislation vaguely forbids those with "contagious" diseases to "expose themselves in public places," without specifying whether these are airborne or bloodborne infections [7, 8]. Another state mandates that any person suspected of having a sexually transmitted disease who refuses examination and treatment must be immediately quarantined [7, 9].

The Institute of Medicine (IOM) raised concern over the patchwork of state regulations in its 2002 report *The Future of the Public's Health in the 21st Century* [3]. The Department of Health and Human Services' *Healthy People 2010* report echoes the IOM, asserting that "the nation's public health infrastructure would be strengthened if jurisdictions had a model law and could use it regularly for improvements" [10]. To answer this plea, the Public Health Statute Modernization Collaborative was assembled. This initiative, funded by the Robert Wood Johnson Foundation, brought together several public health scholars, governmental and national organizations, and five states to develop a model law. The result was the Turning Point Model State Public Health Act (the "Turning Point Act"), the most comprehensive model state public health act in United States history [4, 6].

The Turning Point Act, released in September of 2003, is a broad template which state and local authorities can utilize voluntarily to assess their internal laws. It provides a thorough, systematic legislative model for delegating authority, encouraging collaboration, and providing ethical and constitutional public health services. Broad in scope, the Turning Point Act was designed to be interpreted in the context of contemporary state public health systems. Of note, several areas of public health interest were omitted, such as provisions for seatbelt and tobacco use, health insurance legislation, or mental health and substance abuse policies [4, 6, 7].

The Turning Point Act at Work

Undoubtedly, the Turning Point Act has made a major impact on legislation in several states. Alaska passed an extensive bill based on the Turning Point Act, modernizing their surveillance and reporting, privacy, and powers of authority for public health services [11, 12]. In 2008, Colorado passed SB 08-194, the Public Health Revitalization Act [13, 14], Based largely on the Turning Point Act, it mandates newly defined leadership, enhances collaboration, and provides for vital public health services concerning infectious and chronic diseases. Several other states have passed less extensive but significant legislation. Louisiana's H.B. 1321, passed in 2003, created an environmental health surveillance system [15, 16]. Montana's S.B. 160, passed in 2003, requires its state Department of Health and Human Services to develop strategic plans for data collection, reporting, and performance measures [17, 18]. During the period between January 1, 2003 and August 15, 2007 (the time during which the Centers for Law and the Public's Health tracked Turning Point Act legislation), 33 states introduced a total of 133 legislative bills, 48 of which were passed [19-21].

The Turning Point Act was a historic legislative initiative, advancing American public health law while allowing states to work independently and voluntarily. A much-anticipated attempt to rectify the many shortcomings in public health statutory law and regulations, it resulted in sweeping overhauls of public health infrastructure and legislation in several states. In the upcoming years, states will begin to implement the historical health reformative policies enacted by the Patient Protection and Affordable Care Act of 2010. It will be imperative that public health

infrastructure, authority, and collaborations are well defined; The Turning Point Act will remain a useful and reliable model for doing so.

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POLICY FORUM

The Turning Point Model State Public Health Act—Emergency Public Health Law versus Civil Liberties

Mathew Foley, MD, MS

The attacks on the World Trade Center in September of 2001 and the intentional dispersal of anthrax via the U.S. postal system during the same year illuminated the deficiencies of United States public health preparedness. In an attempt to resolve deficiencies in planning, coordination and communication, surveillance, management of property, and protection of persons during a public health emergency, the Turning Point Model State Public Health Act (MSPHA) was created. While the MSPHA has influenced the creation of legislation across the country since 2001, there continues to be controversy surrounding the act's infringement on civil liberties.

Background: Turning Point Model State Public Health Act

At the request of the Centers for Disease Control and Prevention, the Centers for Law and the Public's Health at Georgetown and Johns Hopkins Universities presented a draft of the Model State Emergency Health Powers Act (MSEHPA), which they explained was "designed to serve as a tool for state, local, and tribal governments to use to revise or update public health statutes and administrative regulations" [1], in October 2001. The original draft was revised due to criticisms and completed on December 21, 2001. The document was revised further by the Turning Point National Collaborative on Public Health Statute Modernization, funded by the Robert Wood Johnson Foundation as part of its Turning Point Initiative, and a final draft was released on September 16, 2003.

Believing that law has long been accepted as an important tool of public health [2, 3], the MSPHA's authors recommended that state public health laws be reformed to serve that purpose effectively. Current state laws are inconsistent across states [2], outdated in their understandings of disease, and predate changes in constitutional (e.g., equal protection and due process) and statutory (e.g., disability discrimination) law [2]. As the Centers for Law and Public's Health states, "The MSEHPA grants public health powers to state and local public health authorities to ensure a strong, effective, and timely planning, prevention, and response mechanisms to public health emergencies (including bioterrorism) while also respecting individual rights" [4].

Points of Contention

One of the most outspoken opponents of the MSEHPA, on which Article VI of the Turning Point Model is based, is George Annas, who eloquently outlines a few of the most popular objections to the act: (1) bioterrorism is inherently a federal issue, and

only secondarily a state issue; (2) the premise that Americans must trade freedom for security in the event of a bioterrorist attack is wrongheaded, as is the presumption that the public and physicians would not cooperate except under threat of law; and (3) the arbitrary use of force by public officials with immunity from liability is incompatible with medical ethics, constitutional principles, and basic democratic values [5, 6].

The authors of the MSEHPA responded to the objection that bioterrorism is exclusively a federal issue. They point out that, while the federal government has an important role in bioterrorism, states and localities would be the first to detect an outbreak and be critical in its containment.

In regards to Annas's third objection, the fear of public officials acting with immunity from liability is real, and the act goes partway toward addressing that possibility in recommending separation of power. While the governor is able to declare a state of public health emergency under a set of predetermined guidelines, the legislature can terminate this state of emergency at any time, and such termination will override any renewal by the governor [7]. Processes for discipline or punishment for abuse of power by the governor or any public health agency can be examined under each state's constitution. One of the most elegant constructions of the MSEHPA is the division of power among the different branches of government.

Annas's concern over the degree to which our civil liberties need to be restricted to protect the public as a whole during a state of a public health emergency is valid. It is easier to take away the civil liberties of someone who has committed a crime than to remove someone's freedoms because he or she had the misfortune to become infected with a deadly, contagious virus. Our society does, however, have a precedent for restricting civil liberties when persons are placing the health of others at risk—tobacco laws. We limit individuals' freedom to smoke tobacco in certain public areas, for example, because we deem it a health risk to innocent bystanders. But being infected with a deadly virus is a bit different. The victim did not choose to become infected or to infect others. The authors of the act recognize this ethical dilemma—penalizing people for circumstances beyond their control—and reply that “the MSEHPA provides carefully crafted safeguards of personal rights; indeed the standards and procedures in the MSEHPA are more rigorous than those in many current public health statutes” [8].

Another ethical concern raised by the act is compliance during a state of public health emergency. Is the public more likely to comply with state or agency orders if they are merely asked to do so or if there are legal consequences for noncompliance? People in the U.S. are not mandated, for example, to vaccinate themselves or family members. While one might think that this is a personal choice, it is not that simple. The unvaccinated person risks not only his or her own health, but also the health of others. Those who choose not to be vaccinated may become infected and act as reservoirs and vectors of disease. The unvaccinated person may even infect others who have been vaccinated because immunity wanes over time.

Certain illnesses remain in our communities because less than 100 percent of the public chooses to be vaccinated. That said, a good percentage of America does accept vaccinations voluntarily. In 2008, 76.1 percent of eligible American children completed the entire childhood vaccination series [9]. The level of trust in medical recommendations is high enough that our childhood vaccination recommendations have been successful. We have been able to limit infections such as diphtheria, *Haemophilus influenzae*, polio—even pneumococcus and more deadly diseases. Would compliance be improved if vaccinations were law? This is what the MSEHPA’s authors suggest.

Annas cites the example of the postal dissemination of anthrax to illustrate public acceptance of the medical community and government guidelines. During the anthrax infections in 2001, emergency departments and physicians’ offices were flooded with people looking for testing and prophylactic antibiotics. This was not mandated by the government at the time. The authors of the act believe that most people will comply with public health advisements, but that “common sense suggests that public health officials may need adequate authority to avert a significant risk” [8].

The danger of mandating vaccinations or treatments during a public health emergency is that it may increase mistrust in the government. Why would the government need to mandate a treatment that is in the public’s best interest? The enforcement of a mandate may backfire and result in less public compliance. The authors understand this delicate balance between mandate and guidelines to achieve the best rate of compliance and still believe the MSEHPA is needed.

The authors of the act should be applauded for their attempt to update public health policy for the current times; they produced a quality manuscript. But the MSPHA is not a one-size-fits-all model. It needs to be modified for each specific state and cause to which it is applied.

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MEDICINE AND SOCIETY

In Defense of Appealing to Emotions in Media Coverage of Catastrophe

Donna Rosene Leff, PhD

It has been said of Americans that we seem to have an insatiable demand for seeing and hearing from people who are the victims of disasters and emergencies.

Reviewing an addiction memoir in the *New York Times Book Review*, David Carr, himself a recovering addict and memoirist, writes, “Car crashes happen in different ways, but they all end the same, with the rest of us looking on in sympathy and prurience. ‘I hope they’re O.K., but I’d like to get a look if they’re not’” [1].

Exactly. Just ask Ruth Shulman and her son, two ordinary California residents leading lives out of the public eye until their car rolled over on a highway, trapping them inside and leaving Ruth a paraplegic [2]. As it turned out, the helicopter medic crew that came to their rescue was filming and taping the incident for *On Scene Emergency Response*, a television documentary that aired months later. Neither Shulman had given permission to be interviewed or taped; in fact, the injured Mrs. Shulman was unaware that her nurse was wired and, after the program aired, she sued the show for invasion of privacy.

The California Supreme Court was quite thoughtful in weighing Mrs. Shulman’s claims, balancing the legitimate public interest in an accident that occurred on a public highway against her expectation of privacy. The court shows deference to the First Amendment and especially to the editing process, allowing the media to determine for themselves what should be deemed newsworthy and therefore holding that, as a matter of law, the details of the rescue “were of legitimate public concern because they were substantially relevant to the newsworthy subject of the piece,” which, despite its magazine format, the court considered news [2]. But the court also held that Mrs. Shulman could reasonably expect that the helicopter, like a hospital room, would be a private place which the media had no right to enter. In the words of the California court, “In short, the state may not intrude into the proper sphere of the news media to dictate what they should publish and broadcast, but neither may the media play tyrant to the people by unlawfully spying on them in the name of newsgathering” [2].

So the law gives journalists a certain amount of latitude, but it doesn’t address the ethical questions—roughly, when are we voyeurs gawking at an accident, and could gawking ever serve a larger purpose? Do journalists themselves balance the need for information against an individual’s right to privacy or the possible effects of coverage on the viewing population?

Journalism ethics codes are direct, if not entirely helpful about what is required of the journalist. Under the heading “Minimize harm,” with a tacit nod to the medical profession, the Society of Professional Journalists (SPJ) urges the media “to show compassion for those who may be affected adversely by news coverage” and to “avoid pandering to lurid curiosity” [3]. The code calls for sensitivity when “seeking or using interviews or photos of those affected by tragedy” and recognition that “gathering or reporting information may cause harm or discomfort”[3]. The newsworthiness test is a useful benchmark against which to assess whether media coverage is disturbing for legitimate reasons or idly sensational—although even when there is consensus on newsworthiness (think tsunami, hurricane, earthquake), critics raise questions about the extent and intensity of coverage.

Photographs of Disaster: Controversial Coverage

An Indian Ocean tsunami on December 26, 2004 killed 275,950 people [4], after an earthquake released energy equivalent to 23,000 Hiroshima-type atom bombs [5]. The ensuing media coverage was global, ranging from overarching explanations of the region’s geology and disease, poverty, and homelessness among the victims to emotional segments on the survivors’ personal stories. The coverage became a template for Hurricane Katrina, which struck New Orleans and the Gulf Coast on August 29, 2005, and the devastating Haitian earthquake on January 12, 2010. Massive destruction and tragedy are followed by thousands of news stories generating billions in relief dollars. Individual reporters stand out either for excellent and sensitive treatment of the victims or for grandstanding that borders on exploitation.

Taken as a whole, the work of the reporters covering these disasters has been more heroic than exploitive, with reporters working under stressful, often frightening conditions to make the world aware of unfolding tragedies of enormous magnitude. On balance, the benefit of telling those stories outweighs the possible cost to individual privacy and what may be seen as a disregard for “appropriateness.” (In many cases, stories that would seem to be sensational are not invasive; they appear with the consent, sometimes even at the urging of the subjects, who may have their own motives for wanting their stories told [6].) Without the focus on the often horrific details of individual experiences, the stories would take on a vagueness and generality that make a distant or overwhelming tragedy even more difficult to grasp.

The power of the emotional appeal is most resonant in the tragedy of September 11, 2001. The coverage suffered from the paradox of being both overwhelming and often without content. For hours after the planes struck and then after the buildings collapsed, no one really understood what was happening or its magnitude, including reporters, especially on-air anchors. No debate was more heated than that over whether to show video and photographs of bodies falling from the twin towers of the World Trade Center. For more than 90 minutes on that day, perhaps as many as 200 people, one by one, went out windows or the roof of the towers [7].

One image, by AP photographer Richard Drew, became the icon of this story, a kind of stop-action view of The Falling Man as he falls, head first, one knee slightly bent, with the two towers standing clearly behind him [7]. *Esquire* writer Tom Junod recounts, in painful detail, a reporter's attempt to identify the man. Several families reacted with anger to reporters' inquiries, although others genuinely wondered whether the Man could be their loved one. Junod observes that the photo was published just once by most news outlets, then disappeared:

Papers all over the country, from the *Fort Worth Star-Telegram* to the *Memphis Commercial Appeal* to the *Denver Post* were forced to defend themselves against charges that they exploited a man's death, stripped him of his dignity, invaded his privacy, turned tragedy into leering pornography....

At CNN, the footage was shown live, before people working in the newsroom knew what was happening; then after what Walter Isaacson, who was then chairman of the network's news bureau calls "agonized discussions" with the "standards guy," it was shown only if people in it were blurred and unidentifiable; then it was not shown at all....

In the most photographed and videotaped day in the history of the world, the images of people jumping were the only images that became, by consensus, taboo—the only images from which Americans were proud to avert their eyes [7].

Junod disparages the media critics and, to some extent, the media, writing, In a nation of voyeurs, the desire to face the most disturbing aspects of our most disturbing day was somehow ascribed to voyeurism, as though the jumpers' experience, instead of being central to the horror, was tangential to it, a sideshow best forgotten [7].

Junod's argument is essential to understanding both why the media tell these stories and why they must. The idea that the image of The Falling Man could put viewers in touch with *what he experienced* is crucial. Sanitized stories about groups of victims or general circumstances may inform to a degree, but they also allow us to avoid experiencing the true devastation occurring on the ground. Emotional appeals—and disturbing images of disaster victims are the very epitome of emotional appeal—illuminate the reality of the situation in ways that mere facts cannot.

Time magazine managing editor Richard Stengel made this point in an editor's note explaining his decision to run a cover photograph on August 9, 2001, depicting Aisha, an 18-year-old Afghan woman, hauntingly beautiful but maimed by a hole and scar tissue where her nose had been cut off by her husband as a Taliban court-ordered punishment for fleeing his family [8]. Stengel acknowledges that the photo will be seen by children, that it is disturbing. Predictably, media critics did accuse the

magazine of running the photo for political purposes and of being overly sensational. Anticipating those comments, Stengel wrote,

But bad things do happen to people, and it is part of our job to confront and explain them. In the end, I felt that the image is a window into the reality of what is happening—and what can happen—in a war that affects and involves all of us. I would rather confront readers with the Taliban’s treatment of women than ignore it. I would rather people know that reality as they make up their minds about what the U.S. and its allies should do in Afghanistan [8].

Stengel made the right call. By showing readers the truth, by not putting a filter between readers and the image, by describing how Aisha’s brother-in-law held her down while her husband pulled out a knife and sliced off her ears, then her nose, *Time* makes it impossible for us not to understand what restoring power to the Taliban means to women. The photograph of Aisha’s face may not spur us to further involvement in Afghanistan; it may be that most Americans are inured to violent images and don’t really care about the fate of oppressed women in Afghanistan. But journalists’ moral responsibility isn’t to elicit a particular reaction or outcome; their responsibility is to bring home the truth.

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HISTORY OF MEDICINE

The History of Point-of-Care Ultrasound Use in Disaster and Mass Casualty Incidents

Dana Sajed, MD

Disaster and mass casualty incidents (MCIs) are defined as occurrences wherein the scale and volume of injuries exceeds the ability of medical response at multiple levels. Coordinated responses to MCIs place a strain on the capacity of first responders in the field, medical personnel, and health care resources. The sudden increase in the number of patients and the possibility that many of them are critically injured create a need for screening and diagnosis rapid enough to compensate for the extreme patient load. Moreover, as a result of the disaster, many people seek medical care for both acute and routine conditions unrelated to traumatic illness. Hence, ultrasound performed by first responders and clinicians is in many ways ideally suited for disaster situations because it is a rapid, portable diagnostic tool with a variety of applications.

While radiologists have long appreciated the usefulness of ultrasound, most other clinical specialties have only recently begun to recognize the many benefits of this technology in the care of the critically ill or injured patient. The role of sonography in trauma has been well established, as demonstrated by the focused assessment by sonography in trauma (FAST) examination, which is now a routine part of trauma care [1]. Ultrasound guidance has been shown to improve patient safety during a variety of invasive procedures [2-5] and is a recommended practice in patient safety guidelines both in the United States and abroad [6, 7]. As a bedside tool, sonography has been shown to aid in the management of trauma in pregnancy, shock and hypotension, and orthopedic injuries, and has myriad other applications related to mass casualties [8, 9]. A number of professional societies now require training in point-of-care ultrasound [10, 11] for their graduates, and the increased familiarity of physicians with this technology and its relative portability make hand-carried ultrasound an ideal tool for both diagnostic measures and interventional guidance in disaster and mass casualty settings.

Among the first to describe and quantify the use of point-of-care ultrasound in a natural disaster setting were Sarkisian and colleagues [12], following a magnitude-6.9 earthquake that devastated northwestern Armenia in December 1988. This incident resulted in more than 25,000 deaths and roughly 150,000 injuries in a region where the population was nearly 700,000 people. Yerevan, the capital city, was relatively unaffected, and Republic Hospital, which had 1,000 beds, served as the main medical facility for casualty victims. The lone available computed tomography (CT) scanner in Yerevan was dedicated to managing head-trauma cases. Two triage

rooms, each with an ultrasound machine, were created in the lobby of the hospital. Six physicians staffed the two rooms on a rotating basis and performed ultrasound examinations on as many trauma victims as time permitted. In a 72-hour period, 750 patients came through the hospital. Four hundred of these patients received 530 ultrasound examinations either in the makeshift triage rooms or the hospital's emergency ward.

Of the 530 exams, 304 were considered negative, and 96 (about 20 percent) demonstrated some form of pathology. Sixteen patients had operative intervention, usually laparotomy, based solely on clinical examination and ultrasound findings. The authors reported four false-negative cases (less than 1 percent) among the 530 studies performed, which illustrates the limitations of point-of-care sonography in trauma: one patient was found to have a ruptured kidney on laparotomy; another, a retroperitoneal hematoma; the third had a subcapsular hematoma of the spleen; lastly, an obese patient was noted to have a massive hemothorax. Ultrasound is known to have a low sensitivity for detecting hollow viscus or retroperitoneal injuries, and obesity and subcutaneous emphysema decrease exam accuracy. Despite these limitations, ultrasound proved to be highly sensitive and specific in this resource-limited circumstance [12].

In another study following a magnitude-7.6 earthquake in Turkey in August 1999, Keven and colleagues [13] examined the prognostic utility of ultrasound in determining the need for dialysis from crush injuries. Estimates of fatalities and casualties from this event vary, but the generally reported numbers indicate that approximately 17,000 people were killed and another 45,000 were injured [14]. Particularly devastating were the crush injuries suffered as a result of thousands of structural collapses, an outcome later observed following earthquakes in Bam, Iran, in 2003 [15], Kashmir in 2005 [16], and in Haiti in January 2010 [17].

During the 1999 earthquake in Turkey, 5,302 patients were admitted to various regional hospitals; 639 of them had renal complications due to crush injuries, and 477 underwent hemodialysis after developing acute renal failure. Renal ultrasound in particular was used to gauge whether victims needed urine alkalization and administration of intravenous mannitol and to identify the amount of intravenous fluid needed. Specifically, physicians at the various hospitals studied Doppler flow to the kidneys to calculate the renal resistive index, which was found to correlate reliably with the presence of oligoanuria and the need for hemodialysis. The authors concluded that this measurement might provide predictive information about recovery from acute renal failure resulting from crush injury [13].

While these earlier reports describe the use of hospital-based ultrasound during mass casualties, more recent events and technological developments have allowed medical personnel and first responders to take the ultrasound to the patient in the field. Dean et al. who took hand-carried ultrasound to Guatemala in 2005 following devastating mudslides, describe the variety of uses they found for the ultrasound machine and the range of probes with which they assessed patients in the field [18]. In all, 99 patients

received 137 ultrasound exams: 58 pelvic, 34 right upper quadrant, 23 renal, 6 other abdominal, 5 orthopedic, 4 cardiac, 3 pleura and lung, 3 soft tissue, and 1 focused assessment by sonography in trauma (FAST). Most of these exams were performed with a single curved transducer in an austere setting.

Mazur and Rippey reported on the use of portable ultrasound by a disaster medical assistance team (DMAT) after a cyclone in Western Australia during March 2007 [19]. The need to transport patients from their remote location for tertiary-level care demanded rapid diagnostic capabilities, and, with the region's only CT scanner felled by the cyclone, hand-carried ultrasound helped them determine the severity of patient illness. The primary studies performed were the FAST examination and thoracic ultrasound. This case report indicated that a portable ultrasound machine was easy to transport with a DMAT team and added very little weight or bulk to the total equipment load.

Other authors have described employing ultrasound in disaster response following the tsunami in Banda Aceh in 2004 [20], the Wenchuan earthquake in 2008 [21], and the recent Haitian earthquake [22]. These studies also demonstrate the benefit of sonography for first responders or hospital personnel and for use in remote settings.

In addition to its utility in natural disasters, ultrasound has played an increasingly large role in the evaluation of patients following terrorist attacks and military mass casualty events. Emergency responders and hospital personnel performed FAST examinations following the Madrid train bombing in 2004 [23] and the London Underground bombing in 2005 [24] and during the second Lebanon war in 2006 [25]. Raja and colleagues recently reported performing FAST examinations after explosive mass casualty incidents in a battlefield hospital in Iraq [26]. These authors used the ultrasound for initial assessment and surgical decision making; the trauma team designated stable patients with negative FAST exams for delayed CT scans and imaged higher-priority patients first. Conversely, positive examinations enabled the team to identify patients for whom immediate surgical care was most likely warranted. In their experience, ultrasound proved invaluable for streamlining patient care during a MCI.

Medical deployments to MCIs often involve less-than-ideal conditions. Traditionally, most hand-carried ultrasound machines have not had the durability to withstand the harsh environs. In the past few years, however, compact and robust portable ultrasound machines have been developed and employed in forward military settings and prehospital care. This technology can now be considered for a wider field of practice, including more remote environments [27].

Hand-carried ultrasound is being used for newer diagnostic purposes as well. The technology has shown high accuracy for the detection of pneumothorax [28-30]. Other authors have used ultrasound to detect long bone fractures [31, 32] and to assess adequate fracture reduction [33, 34]. Sonography's adaptability to conditions

where x-ray availability is limited or absent further add to its value as a tool in disaster relief.

During disasters and mass casualties, point-of-care ultrasound makes it possible to diagnose thoraco-abdominal injuries rapidly and accurately, offers a tool for procedure guidance, and has streamlined patient triage. As trainees in various specialties become increasingly familiar with this diagnostic modality and the machines themselves become more portable and durable, ultrasonography will become an integral part of disaster response both in the field and at medical facilities caring for the injured and ill.

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IMAGES OF HEALING AND LEARNING

Art Therapy for Children Who Have Survived Disaster

Sadia Hussain, MD

Art therapy is a growing field of mental health treatment that uses art as a form of illustrative communication. The approach is based on the belief that the creative process, acting as a form of subconscious expression, can help identify inner conflicts, engender self-esteem and self-awareness, reduce stress, and rebuild an overall physical, emotional, and social sense of well-being. Art therapy is thought to be especially valuable for treating children, who often lack the social or verbal capabilities to express their thoughts and emotions, particularly when they have experienced trauma.

History and Principles

The field of art therapy was developed over the course of the 1940s and '50s through the efforts of a few theorists working independently of each other. Psychotherapist and educator Margaret Naumburg pioneered its use with psychiatric patients and published various works on the subject, including *Studies of the "Free" Art Expression of Behavior Problem Children and Adolescents as a Means of Diagnosis and Therapy* (1947) and *Schizophrenic Art: Its Meaning in Psychotherapy* (1950). Naumburg drew on Sigmund Freud's analysis of dream imagery as a presence of the unconscious self. Freud wrote, "We experience it [a dream] predominantly in visual images...Part of the difficulty of giving an account of dreams is due to our having to translate these images into words" [1]. Freud's psychotherapeutic methods relied on free association and the idea of "catharsis," during which the unconscious reveals itself to the conscious. Naumburg saw art as able to connect these two, becoming a window within the self that would allow the conscious to "hear" the unconscious. This is the underlying principle of art therapy: the idea of "drawing from within" [2].

A few years after Naumburg, Edith Kramer emerged on the art therapy scene. Kramer, an artist who fled Prague before World War I, taught art classes to children who were refugees of Nazi Germany. She felt that the creativity involved in producing art had the potential to heal by enabling the transfer of some impulses and emotions into images [3]. When Kramer came to the United States in 1951, she worked as an art therapist with children at Wiltwyck, a residential school for mentally disturbed children in New York City. While Naumburg's theory focused on the idea of making the unconscious conscious through art, Kramer's emphasized the healing potential of the creative process itself [3, 4]. Naumburg's methods were reflective of her role as a primary clinician, whereas Kramer's theories were more defined by her status as an adjunct therapist [4]. The differences that have existed

since the conception of this field persist today, creating a wide variety of forms and goals for art therapy.

Art therapy has three main benefits for the patient: (1) it engages the physical body in relaxation through manipulation of art materials, (2) it allows the patient to engage in a personalized introspective exercise in which the process and finished product become the “symbolic container of traumatic memories” [5], and (3) it allows cognitive reflection through discussion of the artwork [5]. The latter component, especially, enhances the therapist-patient relationship. The process of making art can help bypass verbal centers of the brain, allowing the therapist to safely examine and discuss thoughts manifested in a physical, visual way [6].

In 1971, British pediatrician Donald Winnicott explored art as a potential tool for initiating communication between child and therapist [3]. He developed a technique in which the child and therapist draw together, which he called “the squiggle game” [3]. In this technique, the therapist draws a squiggle on a blank paper, and then the child adds a squiggle, followed by a third squiggle, and so on, until an image is created.

Art Therapy for Disaster Survivors

Recently, an increasing number of pediatric disaster survivors have been treated with art therapy. NYU’s Child Study Center encourages and teaches parents and guardians to use art as a means of communication with children after a stressful occurrence, starting the conversation, for example, by asking about formal elements of the artwork, such as the use of color or shapes [7]. Following the devastation of the Gulf Coast in hurricanes Katrina and Rita, the Hyogo-NOMA Art Therapy Initiative has provided weekly art therapy for over 250 New Orleans public school children who might not otherwise have had access to mental health care. The therapist, Holly Wherry, MAAT, chose the school setting so the children could remain in a familiar, comfortable environment with a built-in support system.

Rebekah Chilcote, an art therapy graduate student at the time of the 2004 tsunami in Sri Lanka, used art therapy to work with 113 girl survivors between the ages of 5 and 13 who were selected by their teachers as those who exhibited the most acute symptoms of grief and trauma [8]. The children were divided into age-appropriate groups of roughly 10 each, which met once weekly for a month. Chilcote prompted the girls to express themselves artistically on a given topic (e.g., “my life, myself” and “the day I will never forget”) and then present their artwork to the group [8]. Chilcote concluded that art is an effective, psychologically beneficial intervention for children who have undergone significant psychological trauma—and one that can be administered cross-culturally [8].

The ICAF, or International Child Art Foundation, established in 1997, is an important force in the field of art therapy worldwide. Following the American tragedy on September 11, 2001, ICAF, in collaboration with psychiatrists and

psychologists, asked children to use their creativity to reduce transgenerational transmission of trauma and hatred by producing a vision of peaceful coexistence [9].

Art Therapy and Trauma

Art has been found to be an especially effective tool for working with both adults and children coping with trauma. A traumatic experience can lead to acute stress disorder (ASD, anxiety or dissociation that lasts for a few days or weeks after a stressor), and posttraumatic stress disorder (PTSD, a more long-lasting constellation of similar symptoms). In one study, pediatric patients suffering from ASD after sexual abuse who were treated with art therapy showed a significant reduction in symptoms [5]. Other situations in which children are treated with art therapy are those associated with grave illness or injury—including cancer, renal disease, chronic pain disorders, and severe burns.

The traumatic experience has been described as a dual occurrence, especially for children. The self dissociates during the trauma, creating a rift between tolerable conscious awareness of the event and the intolerable emotional memory of the event that is tucked away in the unconscious [6]. Physical, emotional, and mental energy are expended in keeping the difficult emotions away from the conscious mind. Neuroimaging shows dissociation (which manifests, for example, as amnesia, depersonalization, emotional detachment, and de-realization) when recall of traumatic events is attempted. The left frontal cortex, specifically Broca's area (responsible for speech), remains inactive, while the right hemisphere—particularly the region around the amygdala, associated with emotional and automatic arousal—is particularly active [10].

Traumatic memories appear to take root not in the verbal, analytical parts of the brain but in the nonverbal regions of the limbic system, from which cognition is somewhat detached (and which, Babette Rothschild postulates, may provide a kind of link to the unconscious mind) [10]. This impairs patients' ability to communicate with themselves or others about their experiences [10]. Children may be further limited by still-developing language skills, all of which makes nonverbal modalities of expression, such as art, formidable tools for treatment.

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Virtual Mentor

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