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Ebola Virus Disease

Ethics and Emergency Medical Response Policy

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Caring for patients affected with Ebola virus disease (EVD) while simultaneously preventing EVD transmission represents a central ethical challenge of the EVD epidemic. To address this challenge, we propose a model policy for resuscitation and emergent procedure policy of patients with EVD and set forth ethical principles that lend support to this policy. The policy and principles we propose bear relevance beyond the EVD epidemic, offering guidance for the care of patients with other highly contagious, virulent, and lethal diseases. The policy establishes (1) a limited code status for patients with confirmed or suspected EVD. Limited code status means that a code blue will not be called for patients with confirmed or suspected EVD at any stage of the disease; however, properly protected providers (those already in full protective equipment) may initiate resuscitative efforts if, in their clinical assessment, these efforts are likely to benefit the patient. The policy also requires that (2) resuscitation not be attempted for patients with advanced EVD, as resuscitation would be medically futile; (3) providers caring for or having contact with patients with confirmed or suspected EVD be properly protected and trained; (4) the treating team identify and treat in advance likely causes of cardiac and respiratory arrest to minimize the need for emergency response; (5) patients with EVD and their proxies be involved in care discussions; and (6) care team and provider discretion guide the care of patients with EVD. We discuss ethical issues involving medical futility and the duty to avoid harm and propose a utilitarian-based principle of triage to address resource scarcity in the emergency setting. CHEST 2015; 148(3):794-800

ABBREVIATIONS: AMA = American Medical Association; CDC = Centers for Disease Control and Prevention; DNAR = do not attempt resuscitation; EVD = Ebola virus disease; PPE = personal protective equipment; RRT = renal replacement therapy

The Ebola virus disease (EVD) epidemic is described by the Centers for Disease Control and Prevention (CDC) as “the largest in history,” affecting not only multiple countries in West Africa but also locally acquired cases involving health-care workers in the United States.¹ As of March 18, 2015, the CDC reports 14,646

laboratory-confirmed cases and 10,236 deaths, with widespread transmission in Guinea, Liberia, and Sierra Leone, and limited transmission in the United Kingdom, Nigeria, Senegal, Spain, the United States, and Mali. Caring for patients affected by EVD while simultaneously preventing EVD transmission represents a central challenge

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of the epidemic. As US health-care facilities care for and prepare to care for patients with EVD by developing protocols and policies, recruiting and training volunteer providers, and practicing the donning and doffing of personal protective equipment (PPE), this challenge becomes more pressing.

The ethical principles we propose carry implications for future infectious diseases where patient care and provider safety must be carefully weighed. To address these ethical concerns, we have developed a model for Resuscitation and Emergent Procedure Policy of patients with EVD. We discuss this policy along with its ethical and scientific rationale. Although the model policy we set forth is intended to guide policy for EVD, it also offers guidance for other communicable diseases that share with EVD the features of being highly contagious, highly virulent, and highly lethal (ie, having a high rate of death). Specific policies may vary depending on relevant features of the infecting agent. For example, Ebola-like viruses, such as Marburg hemorrhagic fever, might be governed by a similar policy. By contrast, Middle East respiratory syndrome is similar to EVD in certain respects, yet the coronavirus that causes Middle East respiratory syndrome is less lethal than EVD, which alters the associated risk assessment.²

Model Policy

Ebola Virus Disease: Resuscitation and Emergent Procedure Policy

1. A code blue will not be called for patients with confirmed or suspected EVD; however, properly protected providers may initiate resuscitative efforts if, in their clinical assessment, these efforts are likely to benefit the patient. This approach represents a limited code status for patients with confirmed or suspected EVD. Code blue refers to paging the code team to come to the patient's bedside and provide emergency medical care; it summons emergency responders throughout the hospital who are not properly donned with PPE and may not have received safety training related to caring for individuals with EVD.
2. Resuscitation will not be attempted for patients with advanced EVD if resuscitation would be medically futile, put treating clinicians at unreasonably high risk of infection, or both. However, all patients with EVD will receive ongoing support and appropriate medical and comfort care.
3. Providers caring for or having contact with patients with confirmed or suspected EVD will be properly

protected and trained, including training in the proper use of PPE.

4. The treating team will anticipate, treat, and/or prepare for likely causes of cardiac and respiratory arrest to minimize the need for emergency response. Goals of care will be evaluated on an ongoing basis.
5. Patients with EVD and their families or proxies will be involved in goals of care discussions throughout hospitalization and will be made aware of limitations of care as they apply. Discussion will include notification of the patient's code status and its rationale. Although neither consent nor assent of the patient, family, or both is ethically required for limited resuscitation status, patients and families are ethically entitled to full disclosure.
6. Care team discretion will guide general management of patients with EVD. Responding providers will exercise discretion regarding which medical interventions, including resuscitative efforts, can be safely and effectively delivered to patients with EVD. Identified ethics consultants will be available on an ongoing basis to members of the health-care team.

Operationalizing the above policy requires modifying existing protocols. Although this could be accomplished by assigning a "do not attempt resuscitation" (DNAR) status to all patients with known or suspected EVD, we propose instead assigning a "limited resuscitation" status to patients with EVD. The alternative of a standard DNAR order carries the following disadvantages: (1) DNAR may be misinterpreted to mean that providers have no obligation to assume reasonable risk when caring for patients with EVD. (2) It is easier to justify limited resuscitation for patients with suspected, but not confirmed, EVD than it is to justify DNAR, because limited resuscitation leaves open the possibility of providing certain resuscitative measures. (3) A limited resuscitation status for patients with EVD maintains a patient-centered focus better than a standard DNAR status. A DNAR order may be understood by some providers to preclude what, in some cases, would be helpful interventions.

Ethical and Scientific Rationale

Balancing Risks and Benefits

Risk of exposure to EVD varies depending on disease stage:

Ebola virus is usually detectable in the blood at the time of early symptom presentation. It then increases logarithmically and can reach extremely high levels (5-10 billion RNA copies/mL serum). Viral levels are highest when the patient is in the most active phase of the disease.³

EVD is shed in bodily fluids during the acute phase of illness, including saliva, breast milk, stool, and tears.⁴ At all disease stages, there is a scientific basis for protecting health-care professionals and others against EVD exposure by mandating that all personnel coming into contact with patients with EVD wear PPE and undergo specialized training to ensure their safety. As McCullough notes (as quoted in Altman⁵), “there are justified limits on the risk to health and life that health-care professionals are expected to take in the care of patients.”

Ebola virus is detectable in the blood only after onset of symptoms and may take up to 3 days following onset of symptoms to reach detectable levels.⁶ Health professionals caring for individuals with suspected EVD should take the same precautions they would take in cases of confirmed EVD. Because of the uncertainty surrounding diagnosis and associated risk, the ethical justification for following the proposed policy is weaker in suspected EVD than it is in confirmed EVD. We err on the side of minimizing risk to health professionals during the limited time period in which EVD is reasonably suspected but not confirmed. EVD can be reasonably suspected in situations where individuals present with early symptoms of EVD and have had exposure to the Ebola virus (ie, contact with the blood or bodily fluids of a person with EVD, contact with objects contaminated with the blood or bodily fluids of a person with EVD, or contact with animals infected with EVD).⁶

EVD has a substantially higher death rate than other epidemic viral infections. Thus, there is a need to illuminate the duty to treat in the particular context of EVD. Faced with a patient in distress, providers’ strong tendency is to attempt to rescue the patient. Yet, patient advocacy is ethically limited under circumstances where it poses a serious threat to the health or life of others, including health-care professionals.⁷ Although clinicians should generally put self-regarding interests aside to serve those in need, this obligation is not absolute. The obligation to assist may be overridden when there is an unacceptably high risk to health-care professionals. We believe the risk to a provider who assists a patient with EVD without proper PPE training and use is sufficiently high and overrides the obligation providers would ordinarily have in less risky situations.

Most patients with EVD in the United States are likely to be admitted before reaching advanced stages of EVD (eg, prior to developing refractory sepsis with multiorgan

failure). In early-stage EVD, the predominant clinical symptoms are GI.⁸ Early life-threatening situations, such as electrolyte abnormalities, especially sodium and potassium, may result from profuse vomiting and diarrhea, potentially leading to complications, such as cardiac arrhythmia. These complications might be reversible if aggressive life-saving interventions are used. For example, patients with an arrhythmia may benefit from resuscitation measures, such as administration of medication through an existing line or the use of external pacing or a defibrillator. These procedures should be performed by a health-care professional already in the patient’s room and properly donned with PPE at time of the event. By contrast, in late-stage EVD, shock and severe metabolic disturbances occur, resulting in multi-organ failure, which is much less likely to respond to resuscitative measures.⁸

Our support for limited resuscitation contrasts with the approach of ethicists, such as Fins.⁹ According to Fins,

Bleeding patients may be harmed by CPR. Others yet to be intubated could sustain brain injury because of time delays necessitated by the need to arrive and don protective gear. For most, if not all, it will be a futile act because of the lethality of their advanced state of illness, [and] the multisystem organ failure which precipitated cardiac arrest in the first place.⁹

Although we agree that resuscitation is futile in patients with EVD with multisystem failure and uncontrolled bleeding, we do not agree that resuscitative efforts are futile for “most, if not all” patients with EVD. For example, in patients with EVD with perfusing rhythms, there is a reasonable likelihood of benefit from whatever limited resuscitation measures are available by a properly protected health-care professional who is proximal to the patient at the time of arrest. In this respect, we concur with Caplan (as quoted in Altman⁵), who cautions that only patients with Ebola “in extremis” should be entirely excluded for all resuscitative efforts. Resuscitative measures that can be offered by a single provider already in the room at time of arrest are necessarily limited. For example, a single provider cannot simultaneously provide bag-mask ventilation and administer other necessary interventions, such as medications.¹⁰

The ethical duty to offer limited resuscitation attempts is justified on several grounds. First, health professionals agree to assume a standard level of risk of infection as part of entering their profession.^{11,12} As a consequence, assumption of risk has become part of the ethical practice of medicine and other healing professions. As Dwyer and Tsai¹² note,

By choosing to become doctors, individuals accept some duty to treat...The issue here is not a peripheral matter left up to individual choice, but a central concern that helps to define the role of doctoring.¹²

Assumption of risk is evident, for example, in statements of professional organizations, such as the American Medical Association (AMA)¹³ and the American Nurses' Association.¹⁴ The AMA recognizes that under special circumstances, such as urgent medical disasters, the obligation to assume personal risk to care for patients "holds even in the face of greater than usual risks to their own safety, health, or life."¹³ The AMA further notes that although health-care facilities should minimize risk (eg, by ensuring "the availability of protective and preventive measures for physicians and others caring for patients with communicable disease") they must also ensure access to appropriate medical care.¹⁵ The American Nurses' Association posits an obligation to care for patients whenever the value of such care is greater than any harm the nurse might incur. This stance is qualified by the requirement that nursing care not present more than minimal risk to the nurse. For example, a nurse's duty to treat a patient with AIDS may be overridden if the nurse is immunosuppressed, because that nurse's risk exceeds a level considered "minimal."¹⁴

In addition, the historical practice of assuming risk to provide care to patients with communicable diseases lends support to offering limited attempted resuscitation to patients with EVD.¹⁶ Recent history, including treatment of patients with HIV, AIDS,¹⁷ severe acute respiratory syndrome (SARS), and hepatitis A, B, and C demonstrate a commitment on the part of health-care professionals to put patients first, even at risk to their own health or life. Thus, the burden of proof lies with those who would *deny* a duty to assume the risk of treating patients with communicable disease.^{18,19}

The proposed policy prohibits attempting resuscitation in late-stage EVD, when the likelihood of medical benefit is exceedingly poor. Under these circumstances, resuscitative efforts may be withheld from patients with EVD on grounds of medical futility. The logic of this approach is that the mere fact that a patient is imminently dying does not suffice to show that there is a duty to attempt rescue.²⁰ After all, if the patient is actively dying, then any attempt to rescue the patient would fail and should not be instituted. If the likelihood or quality of benefit falls well below a threshold considered minimal, the intervention should not be offered or continued.²¹ This approach applies to all patients, regardless of diagnosis. For both patients with and patients without

EVD, the best available evidence shows that CPR and associated resuscitative measures are ineffective and offer no benefit in the setting of progressive multiorgan failure in a patient already receiving maximal supportive care. Medical futility also justifies withholding other emergent invasive procedures, such as endotracheal intubation or vascular access, in the context of an arrest or other precipitous decline for patients with end-stage EVD. What is unique in the case of patients with EVD is that the medical futility of CPR may arise as a direct result of the delay in responding to the patient's emergency medical needs due to the requirement that all providers be properly donned with PPE. With current donning procedures, the time to prepare providers to respond to patient emergencies renders a standard resuscitation response impractical because of the rapid response required to help an acutely decompensated patient.

Despite limitations on care, we reject the claim by some that "There is no available therapy for Ebola, all the more so for patients in extremis."⁹ The standard of care for patients with advanced EVD consists primarily of supportive care. Volume resuscitation and continued maintenance of intravascular volume status appears to be particularly important. Other organ supportive/replacement therapies, including IV pressers, mechanical ventilation, and replacement therapy have also been used when indicated. When lifesaving measures are futile, providers should avoid suggesting to the patient and family that "nothing" can be done; they should instead assure the patient and family that everything possible will be done to keep the patient as comfortable as possible.²²

In addition to the above distinctions based on disease stage, we note that complicating factors may require case-by-case assessment. When this occurs, the trained and protected treating team should exercise discretion. An appeal to discretion is not ethically grounded in respect for provider autonomy, as some have argued²³; instead, it is based on principles of beneficence and nonmaleficence. The treating team must carefully weigh benefits (to the patient) and risks (to the team). Although appealing to team discretion is ethically supported, it carries the risk that similar cases will be treated differently by different health-care teams. We militate against this concern by encouraging daily discussions among all members of an ongoing care team.

We also urge team discretion for patients with EVD who present with comorbidities, such as pregnancy or concomitant acute illness. Such cases require case-by-case

medical evaluation and ethics involvement. In general, nonemergent surgical procedures should not be performed in patients with suspected or confirmed EVD. Such procedures should be delayed until they can be performed without risk of EVD transmission to providers.³ Emergent operative procedures may require a modified standard of care, with operative capabilities being brought to the isolation unit, rather than having the patient brought to the operative suite.

Minimizing Harm to Others

Under no circumstances should a code blue be called on a patient with EVD that would result in untrained providers being marshaled to the bedside. Thus, “heroic” staff members who are unprotected or improperly attired should not rush to the room of a patient with EVD to perform CPR or other invasive procedures, such as emergent line placement and intubation. The ethical justification for this approach is the principle of non-maleficence, or “do no harm.” With current PPE procedures, the time to prepare providers to respond to patient emergencies renders many resuscitative measures impractical because of the rapid response required to help an acutely decompensated patient. As a consequence, avoiding harm to providers may result in patients foregoing benefits they might otherwise have received. It is worth noting that providers and bioethicists generally apply the principle of nonmaleficence to patients, not to providers or the broader community. By contrast, a principle of utility applies to all people affected by an act or policy. Thus, an institutional policy that minimizes harm to staff, as well as patients, is ultimately justified by utilitarian reasoning, rather than by the standard bioethical principle of nonmaleficence.

Aside from resuscitative interventions, other treatments that may be medically indicated create potentially high-risk exposure to health-care professionals. These include interventions for pregnant women, such as fetal monitoring, cesarean delivery, induction, or surgical repair of lacerations,^{3,24-26} and continuous renal replacement therapy (RRT), among others. Only competent providers trained in proper use of PPE and donned should perform these and other procedures for patients with EVD. The primary treatment team should exercise judgment regarding the appropriate use of potentially high-risk procedures in response to sudden clinical changes. Interventions that carry little chance of benefitting a patient, and that place members of the care team at significant risk, should not be provided. Extracorporeal life support, for example, would fall into this category for patients with EVD with advanced enough disease to

require it. By contrast, RRT may be medically appropriate in some situations.²⁷ Ethics involvement is encouraged to ensure consistency and fairness in policies and practices.

When assessing risk to providers, it is critical to evaluate the scientific basis of risk assessment. Media coverage of EVD in the United States has sometimes focused on “theoretical—but dramatic—possible mutations of the virus rather than consistent, clear, and scientifically supported messages regarding what is known about the virus and what US residents could do to protect their health.”²⁸ When fear, rather than science, becomes the primary driver of EVD policies, this will likely result in suboptimal care for patients with EVD, unnecessary restrictions on civil liberties, or both. State-based proposals for 21-day quarantines of health-care workers and others returning to the United States from West Africa lacked a scientific basis and imposed unnecessary restrictions on individuals. The US Department of Defense’s 21-day quarantine, which applied to all Defense Department personnel returning from EVD-affected areas regardless of risk exposure, also lacked a basis in science, according to the Director of Health and Human Services, Sylvia Burwell.²⁹ When quarantines represent a way to manage fear, not Ebola, they do more harm than good.³⁰ Such measures not only place unfair restrictions on individuals, they also may dissuade health care professionals from contributing in the future to fighting the epidemic.³¹ Avoiding this possibility requires carefully reviewing evidence on an ongoing basis. Just as

It is now ethically untenable and medically unjustifiable to deny life-supporting therapies to patients with human immunodeficiency virus (HIV) infection,...only a few decades ago, the fear of HIV and the perception that AIDS was uniformly fatal led to an approach similar to that currently being taken for EVD.³²

When restricting individual liberties is necessary to protect the public health, the guiding principle should be a principle of least infringement. This requires applying the least restrictive measures possible to protect the public’s health.²⁸

Selecting Patients When Resources Are Limited

Given the resource-intensive nature of providing EVD care, demand for EVD services may exceed the capacity of a Western quaternary care hospital to respond if a significant number of patients with EVD were treated at a single hospital. When this occurs, a utilitarian framework should be used to maximize medical benefit to all patients. Triage is a common interpretation of a utilitarian framework applied to emergency medical treatment

when resources are limited.³³ Triage assigns priority to patients with serious injuries who can be improved with relatively simple procedures but who will not improve without aid.³⁴ Different consequentialist assessments might be appropriate in resource-poor areas, such as Africa, that are responsible for treating many patients. Another criterion that furnishes an ethical basis for allocating scarce resources is the quantity of resources a patient is expected to consume. This criterion is ethically justified on utilitarian grounds as well, because it represents a means to achieving the greatest good for the greatest number of people.

The approach we propose does not base the distribution of limited resources on medical diagnosis or clinical judgment but instead on prioritizing those who are the most critically ill and can benefit from less-intensive resource investments.³⁵ For example, if patients with and without EVD are similarly endangered, those patients who require less costly and risky interventions should receive resource priority. This is not because of diagnosis, but because of the utilitarian value of saving the greatest number of lives. Following the American College of Chest Physicians (CHEST) guidelines, we endorse the same criteria regardless of whether a patient's need arises from EVD epidemic or unrelated conditions (eg, a motor vehicle accident).³⁶

Generally speaking, the principle of utility applies to all patients regardless of diagnosis. For example, if a hospital does not have enough staff or technology to provide RRT to all patients, priority should be assigned to patients with the best prognoses and greatest likelihood of benefit from RRT; among patients with similar prognoses, priority should be assigned to those who require the fewest resources. In practical terms, the result of this approach may mean that a patient with EVD would be denied RRT. To summarize, the focus needs to be on likelihood of benefit, amount of resource consumed, and duration of need (which includes staff time away from any other patient care), rather than on specific diagnoses. The ethical rationale for such an approach is a strictly utilitarian focus on benefits and burdens to affected parties.

One controversial implication of using a utilitarian framework, such as triage, might be that health-care providers merit priority, both in the allocation of scarce life-saving resources and in protection against EVD. This is because they function as multipliers of societal benefit during and after an EVD epidemic.³⁷ Despite this possible implication, our model policy does not directly assign

priority to patients with EVD on the basis of occupation. Instead, we affirm the equal worth and dignity of all patients, which places ethical constraints on the scope of utilitarian analysis.

Conclusions

Our proposed model policy is based on ethical principles and scientific evidence about EVD. We appeal first to the ethical principle of beneficence, emphasizing the patient-centered duty to aid those who are sick. Second, we invoke medical futility to argue that when a treatment offers an exceedingly poor likelihood or quality of benefit, it should not be offered. Third, we stress that the obligation to avoid harm requires setting reasonable limits on caring for patients with EVD. Finally, when demand for resources exceeds an institution's capacity to meet that demand, the utilitarian-based principle of triage should govern the allocation of resources.

We urge ongoing ethics discussion of the principles and policies that should govern communicable diseases more broadly. Not only will natural disease outbreaks continue to occur, there is also heightened concern that biologic agents might be intentionally released as weapons. The CDC recommended heightened surveillance for unusual disease occurrence or increased numbers of illnesses following the September 2001 terrorist attacks in the United States, identifying the following biologic agents as being of highest concern: anthrax, plague, smallpox, botulism, tularemia, filoviruses (Ebola virus, Marburg hemorrhagic fever), and arenaviruses (Lassa fever, Argentine hemorrhagic fever, and related viruses).³⁸ In response to the threat of bioterrorism, the US government continues to take precautions against infectious disease outbreaks, such as smallpox, even though the variola virus that causes smallpox disease was eliminated and no naturally occurring cases have been reported since 1977.³⁹

An emergency response policy is one of several steps necessary to ensure optimal patient care and minimize disease transmission in the face of a communicable disease outbreak. Additional guidance addressing non-emergent safety protocols is needed to manage access to experimental therapies,^{40,41} the use of placebo-controlled clinical trials during public health emergencies,²⁸ the challenges of obtaining informed consent for collecting and sharing biospecimens in the context of a public health emergency,²⁸ the safety of individuals who come into contact with deceased patients,⁴² and risk distribution among health-care facilities, health-care specialties, and health-care professionals.^{11,19}

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References

1. 2014 West Africa outbreak. Centers for Disease Control and Prevention website. <http://www.cdc.gov/vhf/ebola/index.html>. Accessed April 2, 2015.
2. Middle East respiratory syndrome (MERS). Centers for Disease Control and Prevention website. <http://www.cdc.gov/coronavirus/MERS/about/index.html>. Accessed April 2, 2015.
3. Wren SM, Kushner AL. Surgical protocol for possible or confirmed Ebola cases. American College of Surgeons website. <https://www.facs.org/ebola/surgical-protocol>. Accessed April 2, 2015.
4. Bausch DG, Towner JS, Dowell SF, Kaducu F, Lukwiya M, Sanchez A, et al. Assessment of the risk of Ebola virus transmission from bodily fluids and fomites. *J Infect Dis* 2007;196(suppl 2):S142-S147.
5. Altman L. Ethicist calls CPR too risky in Ebola. *New York Times*. <http://www.nytimes.com/2014/10/21/health/-ethicist-calls-cpr-too-risky-in-ebola-.html>. Oct 20, 2014. Accessed April 2, 2015.
6. Ebola (Ebola virus disease): diagnosis. Centers for Disease Control and Prevention website. <http://www.cdc.gov/vhf/ebola/diagnosis/index.html>. Accessed April 2, 2015.
7. Jecker NS. Rethinking rescue medicine. *Am J Bioeth*. 2015;15(2):12-18.
8. West TE, von Saint André-von Arnim A. Clinical presentation and management of severe Ebola virus disease. *Ann Am Thorac Soc*. 2014;11(9):1341-1350.
9. Fins JJ. Responding to Ebola: questions about resuscitation. The Hastings Center Bioethics Forum. The Hastings Center website. <http://www.thehastingscenter.org/Bioethicsforum/Post.aspx?id=7135&blogid=140>. Accessed April 2, 2015.
10. Neumar RW, Otto CW, Link MS, et al. Part 8: adult advanced cardiovascular life support: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(18)(suppl 3):S729-S767.
11. Daniels N. Duty to treat or right to refuse? *Hastings Cent Rep*. 1991;21(2):36-46.
12. Dwyer J, Tsai DF-C. Developing the duty to treat: HIV, SARS, and the next epidemic. *J Med Ethics*. 2008;34(1):7-10.
13. American Medical Association. Opinion 9.067: Physician obligation in disaster preparedness and response. In: *AMA Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008-2009.
14. Freedman B; American Nurses' Association, Committee on Ethics. Health professions, codes, and the right to refuse to treat HIV-infectious patients. *Hastings Cent Rep*. 1988;18(2):20-25.
15. American Medical Association. Opinion 2.25: The use of quarantine and isolation as public health interventions. In: *AMA Code of Medical Ethics*. Chicago, IL: American Medical Association; 2008-2009.
16. Iserson KV, Heine CE, Larkin GL, Moskop JC, Baruch J, Aswegan AL. Fight or flight: the ethics of emergency physician disaster response. *Ann Emerg Med*. 2008;51(4):345-353.
17. News in context: Ebola and AIDS comparisons. The Hastings Center website. http://www.thehastingscenter.org/News/Detail.aspx?id=7154&terms=ebola+and+%23filename+*.html. Accessed April 2, 2015.
18. Frader J, Ross LF. Responding to Ebola: health care professionals' obligations to provide care. Hastings Center Bioethics Forum. The Hastings Center website. <http://www.thehastingscenter.org/Bioethicsforum/Post.aspx?id=7168&blogid=140>. Accessed April 2, 2015.
19. Arras JD. The fragile web of responsibility: AIDS and the duty to treat. *Hastings Cent Rep*. 1988;18(suppl 2):10-20.
20. Jecker NS. The problem with rescue medicine. *J Med Philos*. 2013;38(1):64-81.
21. Schneiderman LJ, Jecker NS. *Wrong Medicine: Doctors, Patients, and Futile Treatment*. 2nd ed. Baltimore, MD: Johns Hopkins University Press; 2011.
22. Schneiderman LJ, Faber-Langendoen K, Jecker NS. Beyond futility to an ethic of care. *Am J Med*. 1994;96(2):110-114.
23. Halpern SD, Emanuel EJ. Ethical guidance on the use of life-sustaining therapies for patients with Ebola in developed countries. *Ann Intern Med*. 2015;162(4):304-305.
24. Frontieres MS. Guidance paper: Ebola Treatment Centre (ETC): pregnant and lactating women. Brussels, Belgium: Medecins Sans Frontieres; 2014.
25. Practice advisory: care of obstetric patients during an Ebola virus outbreak. American College of Obstetricians and Gynecologists website. <http://www.acog.org/About-ACOG/News-Room/Practice-Advisories/ACOG-Practice-Advisory-Care-of-Obstetric-Patients-During-an-Ebola-Virus-Outbreak>. Accessed April 2, 2015.
26. Recommendations for breastfeeding/infant feeding in the context of Ebola. Centers for Disease Control and Prevention website. <http://www.cdc.gov/vhf/ebola/hcp/recommendations-breastfeeding-infant-feeding-ebola.html>. Accessed April 2, 2015.
27. Conner MJ, Kraft C, Mehta AK, Varkey JB, Lyon GM, Crozier I, et al. Successful delivery of RRT in Ebola virus disease. *J Am Soc Nephrol* 2014;26(1):31-37.
28. President's Commission for the Study of Bioethical Issues. *Ethics and Ebola: Public Health Planning and Response*. Washington, DC: US Government Printing Office. 2015.
29. Burwell S. Federal government response to Ebola. Senate Appropriations Committee Hearing [transcript]. <http://www.c-span.org/video/?322641-1/hearing-federal-government-response-ebola>. November 12, 2014. Accessed April 2, 2015.
30. Caplan A. Quarantine is being used to manage fear, not Ebola. *Time Magazine*. October 29, 2014. <http://time.com/3546125/ebola-quarantine-chris-christie-kaci-hickox/>. Accessed April 2, 2015.
31. Gonsalves G, Staley P. Panic, paranoia, and public health—the AIDS epidemic's lessons for Ebola. *New Engl J Med*. 2014;371(25):2348-2349.
32. Lamontagne F, Clément C, Fletcher T, Jacob ST, Fischer WA II, Fowler RA. Doing today's work superbly well—treating Ebola with current tools. *N Engl J Med*. 2014;371(17):1565-1566.
33. Moskop JC, Iserson KV. Triage in medicine, part II: underlying values and principles. *Ann Emerg Med*. 2007;49(3):282-287.
34. Kipnis K. Overwhelming casualties: medical ethics in a time of terror. In: Moreno J, ed. *In the Wake of Terror: Medicine and Morality in a Time of Crisis*. Cambridge, MA: MIT Press; 2004.
35. Christian MD, Sprung CL, King MA, et al; Task Force for Mass Critical Care. Triage: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *Chest*. 2014;146(4_suppl):e61S-e74S.
36. Biddison LD, Berkowitz KA, Courtney B, et al; Task Force for Mass Critical Care. Ethical considerations: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *Chest*. 2014;146(4_suppl):e145S-e155S.
37. Iserson KV, Pesik N. Ethical resource distribution after biological, chemical, or radiological terrorism. *Camb Q Healthc Ethics*. 2003;12(4):455-465.
38. Recognition of illness associated with the intentional release of a biologic agent. Centers for Disease Control and Prevention website. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5041a2.htm>. Accessed April 2, 2015.
39. Smallpox disease overview. Centers for Disease Control and Prevention website. <http://emergency.cdc.gov/agent/smallpox/overview/disease-facts.asp>. Accessed April 2, 2015.
40. Adebamowo C, Bah-Sow O, Binka F, et al. Randomised controlled trials for Ebola: practical and ethical issues. *Lancet*. 2014;384(9952):1423-1424.
41. Macklin R. Research ethics and Ebola. *The Huffington Post*. October 23, 2014. http://www.huffingtonpost.com/ruth-macklin/research-ethics-and-ebola_b_6037052.html. Accessed April 2, 2015.
42. Guidance for safe handling of human remains of Ebola patients by hospital and mortuaries. Centers for Disease Control and Prevention website. <http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html>. Accessed April 2, 2015.