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The Role of Hospitalists in the Ebola Response in the United States and Abroad

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Concern and fear over an infection and how best to contain its spread is a well-known storyline dating back centuries before the germ theory was hypothesized. During the Plague of Athens in the fourth century BC, upon noticing that physicians and caregivers of the sick were most at risk of dying, the Greek historian and philosopher Thucydides wrote that thwarting the disease likely required more practical measures than simple prayer to the gods.[1] To this day, the fears of contracting disease often outstrip—or worse, override—our practical or scientific understanding.

Ebola has rekindled past concerns about disease transmission, whether real or imagined. In this article we will describe the history of Ebola outside the United States as well as recent events in US hospitals. We will review guidelines for how to prepare hospitals to treat potential Ebola patients and highlight the key role that hospitalists can have in ensuring the safety of their patients and coworkers. We will also describe the emerging role of "global health hospitalists," whose numbers are growing and whose expertise is ideally suited to improving hospital care in developing countries.

EBOLA EPIDEMICS AND HEALTH EQUITY

In the first identified Ebola outbreak in 1976 in Zaire, now the Democratic Republic of the Congo, patients arrived at local hospitals with symptoms that resembled common endemic illnesses like malaria, typhoid, and yellow fever. The ensuing deaths of 11 of the 17 staff members at 1 hospital were only an introduction to the deadly consequences of Ebola and the necessity of vigilant infection control. Unfortunately, not much has changed with each subsequent outbreak; to this day the heralding of an Ebola outbreak denotes the death of healthcare workers. Since the discovery of the Ebola virus 38 years ago, there have been nearly 30 recorded Ebola outbreaks. The mortality rates of prior outbreaks range widely between 25% and 90%; reports of the current outbreak's mortality falls within that range, between 50% and 70%. It is important to note that despite this high mortality, there had been no more than 1600 Ebola deaths worldwide before the 2014 West African pandemic.[2] In comparison, the number of deaths in Guinea, Sierra Leone, and Liberia approaches 6000.[3]

Although these disturbing figures have fueled public fear and panic in the United States, we wonder how many of these deaths were actually preventable. At the epicenter of the current Ebola virus disease (EVD) outbreak are 3 countries especially vulnerable to epidemics, with armed conflict recently crippling the health systems that have now just started to rebuild. When Liberia emerged from its second civil war in 2003, they had barely 50 physicians caring for a country of nearly 4 million.[4] In contrast with the devastating death toll in Liberia, it perhaps should not come as a surprise that out of the 10 known cases of Ebola that were treated in the United States and caught early, none have resulted in death. With an advanced healthcare infrastructure in place, the mortality rate for EVD in the United States has been close to zero. Although the true unpreventable case fatality rate in West Africa is unknown, the positive outcomes in the United States cases illustrate that hospitals can treat EVD successfully, provided that they are well staffed, supplied, and prepared.

Furthermore, the stark difference in access to quality healthcare between nations suggests that combating the virus should not be our only concern. In fact, EVD itself is only an acute symptom of a much larger, chronic problem with the health systems in Guinea, Sierra Leone, and Liberia. Western countries must direct more resources and attention to improving the overall quality of care in these countries, for although the underlying inequities may be limited to places like Guinea, Liberia, and Sierra Leone, the resulting threat is a global one.

PREPARING FOR THE FIGHT AGAINST EBOLA IN THE UNITED STATES

On September 25, 2014, Thomas Eric Duncan presented to Texas Health Presbyterian Hospital with fever, abdominal pain, and headache 11 days after transporting a pregnant neighbor in his home country of Liberia who later died of EVD. Duncan was discharged from the emergency room without admission.

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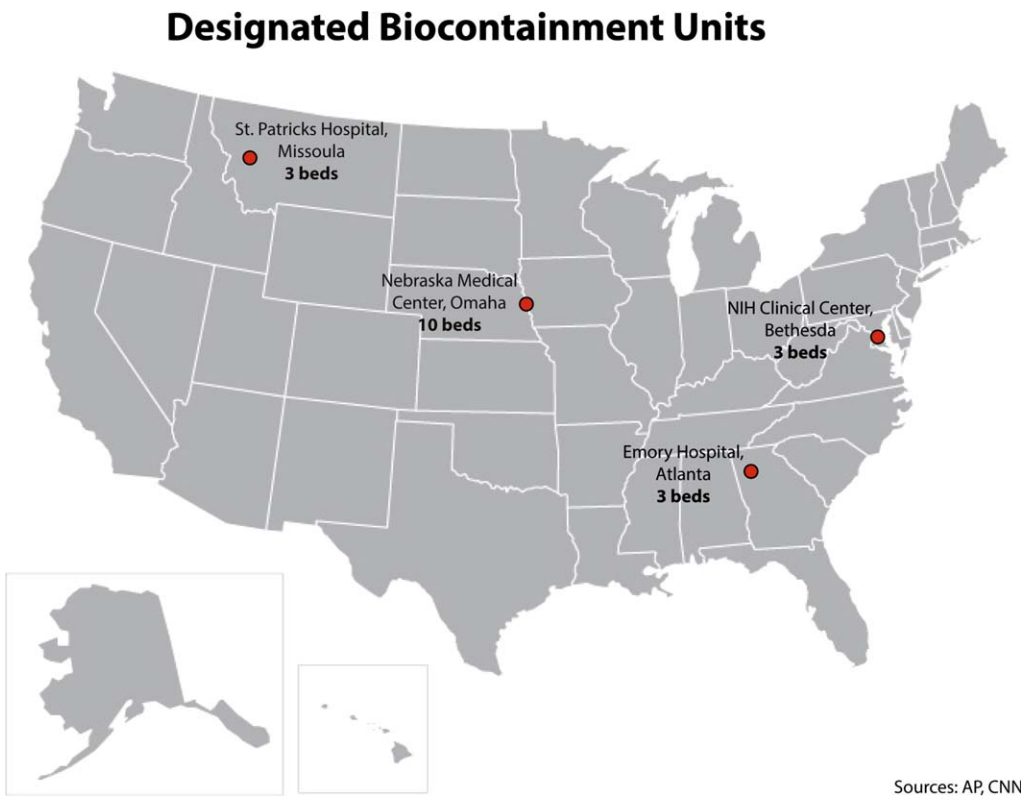

FIG. 1. Regional centers designated as biocontainment units.

Three days later, on September 28, 2014, an ambulance was called and transported him to Texas Health where he was admitted. He was isolated and the hospital followed existing Centers for Disease Control and Prevention (CDC) guidelines for infection control. He was confirmed to have EVD on September 30, 2014. He was cared for by the healthcare providers at Texas Health Presbyterian Hospital, but despite their care, his condition deteriorated. Eric Duncan died on October 8, 2014. About 120 healthcare workers came into contact with the patient. None of his 48 contacts prior to admission to the hospital contracted the disease. However, 2 nurses who cared for him during his admission developed symptoms and were confirmed to have Ebola. An alarm was sounded across the United States, awakening hospitals to the reality of their vulnerability and need for preparedness.[5]

For any healthcare worker treating EVD, whether working in a hospital here in the United States or an Ebola treatment unit (ETU) in West Africa, intensive training is necessary to keep oneself safe. Although infection control is not a novel concept, the stakes have undoubtedly been raised, as even the smallest misstep can be deadly when dealing with the Ebola virus. We were participants in a 3-day infection control training program conducted by the CDC in Anniston, Alabama, which aimed to prepare healthcare workers to assist with the Ebola response in West Africa. Throughout the training, we repeatedly donned and doffed personal protective equipment (PPE), following protocols established by the World Health Organization and Doctors Without Borders (Médecins Sans Frontières):

1. Use a combination of contact, droplet, and standard precautions, ensuring no area of skin is left uncovered.
2. Enter and exit with a buddy; inspect one another for breaches at each step of donning, caring for the patient, and doffing.
3. Wash gloved hands with 0.5% chlorine bleach between tasks and patients.
4. Exit at the slightest breach of infection protocol.
5. Doff PPE per protocol and under supervision; take great care not to contaminate oneself.

Doffing is considered the most difficult and also the most important part, with 7 pieces to remove and no less than 20 steps to do so. After 3 full days of training, although we felt more confident with the carefully choreographed movements of donning and doffing, we were also more aware of the many opportunities during which a breach could occur. Despite our repeated practice, the training staff was firm in telling us that we were still not prepared to work in an ETU. We had only undergone what could be called a "cold" training. To work in the "hot zone" of the ETUs, it is essential to undergo additional mentorship and training once in the field. We believe a similar approach to

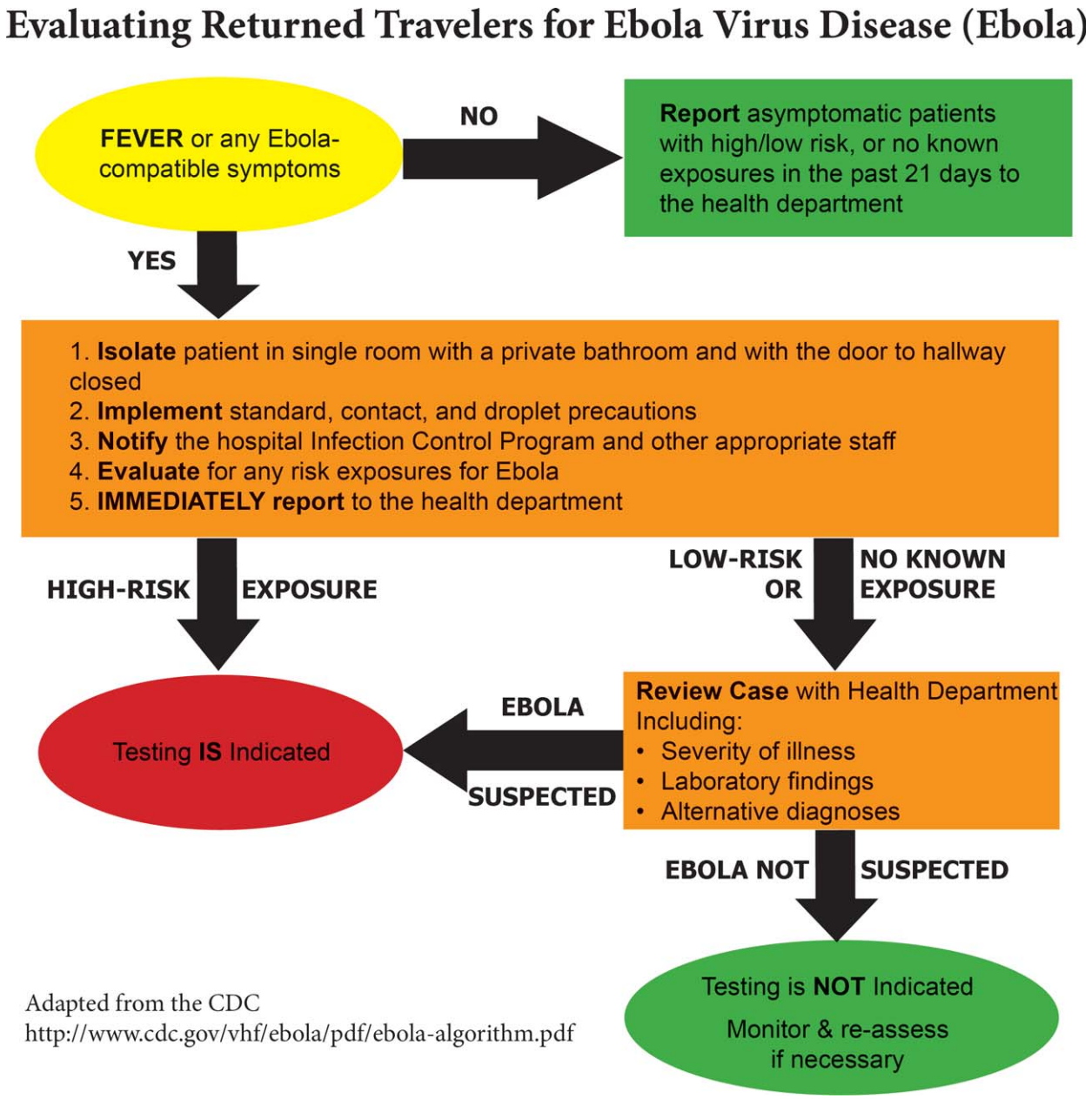

FIG. 2. Process for evaluating returned travelers for Ebola virus disease.

extensive training should be employed for all healthcare workers on the front lines of an Ebola response, both in the United States and abroad.

Given the complexity of the infection control practices above, questions have appropriately been raised about US healthcare facilities' aptitude at providing care for patients with EVD. Although hospitals have historically been "focal point(s) for dissemination of infection" of Ebola, this does not have to be the case.[6] With appropriate preparedness, training, and understanding of facility limitations, hospitals can also be places of confidence and healing.

Both Emory University and the University of Nebraska have successfully treated multiple Ebola patients without incurring further transmission.[7,8] Much of their success comes from the work of longitudinal teams that are trained in infectious disease response on a regular basis, despite the rare occurrence of a serious outbreak. When Emory scaled up this team upon receiving a confirmed EVD patient, new members were required to pass a proficiency test prior to providing care. Emory's strict adherence to infection control and advanced preparation serve as a model for other institutions.

It is important to recognize that not all hospitals should be fully equipped and staffed for safe care of a patient with EVD. Much like in cases of high-level trauma, regional centers should be identified,

prepared, and available to be called upon in a time of need (Figure 1). At the writing of this article, guidelines for hospitals are evolving; most states, with input from federal and local officials, are moving toward designating regional referral centers. Although the number of designated facilities and standards for each vary by state, general preparedness for care of a patient with suspected or confirmed EVD should include: (1) a designated and trained care team, (2) appropriate and vetted operational protocols, (3) an assigned isolation unit with adequate space for the necessary specialized precautions, (4) separate laboratory and diagnostic capabilities, and (5) a working waste management plan.[9] Although not all facilities throughout the United States will have the capability to care for a patient with EVD, all hospitals must have an action plan.

Triage is the first step; facilities should have well-informed and trained staff prepared to perform assessments of potential cases safely (Figure 2). The ability to temporarily isolate and then efficiently transfer suspected or confirmed EVD patients to an appropriate facility also requires careful planning. Prompt identification, constant vigilance, and accurate histories all serve as stepping stones to a successful outcome and can protect employees and other patients in the process.

Within this proposed structure, hospitalists are uniquely equipped to play a leading role in EVD response. First, hospitalists are frequently responsible for interfacility transfer. Their intimate knowledge of this process and the collegiality they have fostered through its use are both assets in navigating the tiered referral system outlined above. Furthermore, as point people in the acute-care setting who accept patients from emergency medicine colleagues, discuss cases with various consultants, and coordinate discharges with multidisciplinary teams on a daily basis, hospitalists have honed communication and leadership skills that are highly valuable in collaborative efforts. Finally, many hospitalists are also champions of quality and safety in their institutions. The focus on the process of continuous improvement is critical in the face of evolving challenges such as EVD.

GLOBAL HEALTH HOSPITALISTS

The Ebola outbreak is a global crisis that clearly illustrates the challenges of addressing highly infectious diseases in modern times. We have outlined the role of hospitalists and defined the steps toward adequate preparedness within our facilities. By following the measured and practical actions Thucydides advised, we can further strengthen our health systems and work toward the control of this outbreak in the United States. The important role of hospitalists can and should be extended to serve those in poor countries.

Over the last decade, health systems strengthening, health workforce training, and patient safety have come to the forefront of global health priorities, the same priorities that are also at the forefront of many hospitalists' aspirations. Shoeb et al. recently conducted a survey of global health hospitalists. They found that within the framework of global health, hospitalists are uniquely "positioned to contribute to this growing field, particularly in areas such as quality improvement, safety, systems thinking, and medical education, all strengths of the hospital medicine model that could be translated to resource-limited settings."[10]

We believe that hospitalists, with their unique positions and skills, are natural and necessary agents of action in this time of need. Our ultimate aim is for hospitalists to become actively engaged in addressing not only the current Ebola outbreak, but also the extreme inequity of healthcare globally—an inequity that lies at the heart of the current devastation in West Africa. We call upon hospital medicine leaders, from division chiefs to chairs of medicine to chief medical officers to support, encourage, and incentivize their staff and faculty to join the ranks of global health hospitalists as they work to both end gross inequities in healthcare abroad and protect our patients and ourselves back home.

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