Ebola Preparedness: A Panel Discussion

Written by Phil Vinall

During this special session, experts shared their experience and recommendations for how to prepare for caring for patients with or suspected of having Ebola, with a focus on safety.

Michael D. Christian, MD, MSc, Mount Sinai Hospital, Toronto, Ontario, Canada, opened the session with a discussion of some of the key considerations when preparing a hospital to treat a patient with either confirmed or suspected Ebola (Table 1).

As additional resources, he suggested the just-released CHEST Consensus Statement on Care of the Critically Ill and Injured During Pandemics and Disasters, which contains 12 manuscripts and 269 suggestions on preparedness [*CHEST Supplement 4*. 2014]. Other informational websites include the US Centers for Disease Control and Prevention, Emory University, the European Centre for Disease Prevention and Control, Public Health England, the Canadian Association of Emergency Physicians, and the Association of Medical Microbiology and Infectious Disease Canada.

As hospitals prepare to address various levels of demand for services and changes in operating conditions, several areas require special attention; these include space, staff, supplies, standard of care, ICU expansion, and resources (Table 2).

Table 1. Treating Ebola: Key Considerations in Hospital Preparedness

Consideration	Related Questions
Clinical leadership	
Point of first contact	What is the procedure when the patient first presents?
Tests/investigations	What is essential? Which procedures need to be changed?
Where to provide care	What plans are in place for isolation?
PPE/IPAC	Are supplies and procedures in place?
Waste management	Where will waste be disposed? Many services won't take it.
Clinical care	In North America, the vast majority of patients suspected of having Ebola will not have the virus, but they will have something that needs to be treated. How will these patients be cared for safely while they are still being monitored?
Monitoring	
Body fluid control	
Life support	
Blood products	
Antibiotics	
Transport	What plans are in place for interfacing with EMS and critical-care transport services for patients moving between hospitals, or being repatriated?

EMS, emergency medical services; IPAC, infection prevention and control; PPE, personal protective equipment.

Edgar J. Jimenez, MD, Baylor Scott and White Health, Temple, Texas, USA, discussed recommendations for personal protective equipment (PPE) in the context of highly contagious biological agents.

After reviewing some of the mistakes made during earlier disease outbreaks such as the SARS epidemic in Canada in 2003, Dr Jimenez said that there are 2 major directives: force protection and facility protection. To provide guidance, he reviewed several key studies in the area of PPE. Results of a study comparing 2 types of PPE suggested that ordinary gowns, gloves, and masks are inadequate barriers when dealing with an aerosol risk and that breaches in technique can lead to self-contamination even with a highly protective system [Zamora JE et al. *CMAJ*. 2006]. Similar results were seen in another study in which following existing protocols often resulted in virus transfer to the hands and clothing [Casanova L et al. *Emerg Infect Dis*. 2008]. Another area of potential contamination is the use of conventional masks during high-flow delivery of oxygen, as this can aerosolize beyond the 3-foot range that is generally considered unsafe.

Dr Jimenez shared some techniques he recommends to reduce the potential for contamination, including avoiding shoes made of absorbent material and taping gloves longitudinally instead of horizontally. Taping longitudinally prevents one of the most common sources of contamination, as it allows removal of the protective equipment together with the gloves as one unit in a single motion.

Careful cleaning between steps using bleach preparations is an obvious recommendation that is not necessarily always followed, as is ensuring there are sufficient and accessible supplies, especially powered air purifying respirators (PAPR). Dr Jimenez recommended against face masks, preferring hoods that include neck protection. He also recommended the use of oxygen devices that have high-efficiency particulate air (HEPA) filtration.

Following the presentations, the panel engaged in a general discussion. Lewis Rubinson, MD, PhD, R. Adams Cowley Shock Trauma Center, University of Maryland School of Medicine, Baltimore, Maryland, USA, offered 5 questions that anyone considering volunteering for Ebola duty should ask:

- Are you physically able and ready?
- Does the organization have a reliable, consistent supply chain?

Table 2. Key Areas for Preparedness Planning

	Decreasing ← Morbidity and Incident Demands → Increasing		
	Conventional	**Contingency**	**Crisis**
Space	Usual patient care spaces maximized	Patient care areas repurposed (PACU, monitored units for ICU-level care)	Nontraditional areas used for critical care or facility damage does not permit usual critical care
Staff	Additional staff called in as needed	Staff extension (supervision of a larger no. of patients, changes in responsibilities, documentation, etc)	Insufficient ICU trained staff available/unable to care for volume of patients, care team model required and expanded scope
Supplies	Cached/on-hand supplies	Conservation, adaptation, and substitution of supplies with selected reuse of supplies when safe	Critical supplies lacking, possible allocation/ reallocation or lifesaving resources
Standard of care	Usual care	Minimal impact on usual patient care practices	Nonconsistent with usual standards of care (Mass Critical care)
ICU expansion goal	X 1.2 Usual capacity (20%)	X 2 Usual capacity (100%)	X 3 Usual capacity (200%)
Resources	Local	Regional/State	National
	Normal ← Operating Conditions → **Extreme**		

ICU, intensive care unit; PACU, postanesthesia care unit.

Adapted from Christian MD et al. Introduction and executive summary: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. Chest. 2014;146:8S-34S. As adapted from Hick JL et al. Refining surge capacity: conventional, contingency, and crisis capacity. *Disaster Med and Public Health Prep.* 2009;3:S59-S67. Reproduced with permission from the American College of Chest Physicians.

- How good is the security?
- What procedures are in place for medical evacuation of staff?
- Does the organization cut corners?

Dr Jimenez addressed the question of how best to prepare staff to potentially treat/manage a patient with Ebola: key areas are keeping staff members well informed, making sure they feel safe, providing very specific, detailed, and sequenced training, and making sure that all training is followed to the letter.

Michael J. Connor, Jr, MD, Emory University School of Medicine, Atlanta, Georgia, USA, commented that Emory has a self-contained bio-containment unit where a potential or diagnosed case of Ebola would be treated. Only volunteer intensive care unit (ICU) and emergency department (ED) nurses are used on this team, and applicants are vetted before they are accepted. Dr Connor also noted that when the first patient with real or suspected Ebola shows up at a hospital, there is always an influx of untrained personnel such as administrators and the media. As the presence of these individuals can compromise safety, a backup plan is needed, and backups for the backups.

Dr Rubinson brought up the concept of what not to do with staff in disaster situations, and cautioned first against being too quick to reassure. While acting on the basis of uncertain information may be the best or only option in a crisis, it is vital to be clear and honest about what is known and what is not, in order to maintain trust within the organization. He also said that wherever you take care of these patients, it is crucial to identify a hot zone that is never violated, to contain infection and therefore risk. Risk communication is key but it has to be in both directions, with opportunities for the team to have input and make decisions without politics being involved. Dr Jimenez agreed, saying that in his opinion, good organization with a unified command is critical to success.

Dr Connor said that because of the intensity of the gastroenteritis with Ebola, clinicians need to be prepared to deal with large amounts of diarrhea, and to make sure that there is an appropriate way to provide volume resuscitation. At Emory, they use balanced crystalloid resuscitation, not a colloid solution. Appropriate vascular access that is secure and does not carry a lot of risk is important in order to avoid having to put fresh IVs in every 2 days. The disease evolves and some patients develop critical illness. Those patients can be safely treated with life support therapies, and they can receive mechanical ventilation and renal replacement therapy, but always with the caveat of keeping the staff safe.

In closing, Dr Jimenez said to think of safety and organize well. Be sure that each step of the plan is well described and easily followed. Good communication is critical.