



## KEY POINT SUMMARY

### OBJECTIVES

This article discussed the benefits of using a pre-made shelter as a separate Ebola treatment area away from the main hospital to treat patients effectively without interrupting the hospital and especially Emergency Department workflow.

## Development and Use of Mobile Containment Units for the Evaluation and Treatment of Potential Ebola virus Disease Patients in a United States Hospital

Sugalski, G., Murano, T., Fox, A., Rosanita, A. 2015 | *Academic Emergency Medicine*. Volume 22, Issue 5, Pages 616-622

### Key Concepts/Context

University Hospital was in a unique situation for the potential of receiving suspected Ebola patients from Newark (N.J.) International Airport. This situation led to the establishment of an Ebola treatment area (ETA) separate from the main hospital with easy access to hospital employees and equipment when needed. The ETA was built inside a pre-existing building that was empty on the first floor using Western Shelter Systems. This allowed the relatively quick erection of the unit without building a permanent unit.

### Methods

Research methods were not utilized in this article. It is a descriptive article and only compared experiences inside the Ebola treatment area (ETA) versus treating suspected Ebola patients in the Emergency Department (ED) prior to the construction of the ETA. Seven patients were evaluated in the ED and five in the ETA. The difference between patients was that in the initial group seen in the ED six presented from the community while the ETA received four from pre-screening areas by the CDC or State Health Department.

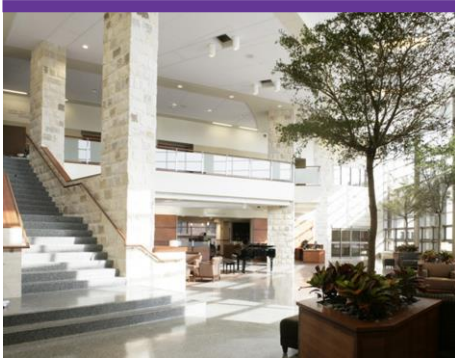
### Findings

University Hospital in Newark, N.J. had access to tents designated for disaster response by the NJ EMS Task Force under the direction of the NJ Department of Health. EMS personnel had been trained in the deployment and use of these shelters in the past. For this reason, and the fact that EMS have training in hazmat donning and doffing procedures, EMS personnel were the staff assigned to the



newly developed Ebola treatment area (ETA) after it was constructed. Initially suspected Ebola patients were brought through the Emergency Department; however, that was found to present challenges in maintaining patient privacy from the news media and from keeping the flow moving for other patients in the ED. Also, to have patients with suspected highly infectious disease in a crowded ED waiting room was not believed to be a safe plan for the community. Administration at the hospital decided to use the provided tents and erect them in the shell of a first-floor building near the ED. This would allow separate patient care and privacy but still allow personnel and materials to flow from the ED to the ETA as needed. Seven patients were treated in the ED and five after the erection of the ETA. The five had longer lengths of stay on average. However, these patients were at higher risk due to arriving from pre-screening areas rather than the general population, which had been the majority of patients evaluated in the ED. The authors noted that the final patient seen in the ETA had the shortest length of stay of any suspected Ebola patient seen by University Hospital; it was theorized this was due to staff becoming familiar with the tents and procedures inside the ETA. Personnel found the experience of caring for patients inside the ETA positive, despite initial fears of providing treatment for suspected Ebola patients. Having experienced personnel to provide assistance and space to safely don and doff was a noted positive comment from working inside the ETA.

The ETA was built inside an erected building that had electricity, plumbing, running water and sewer access; after discussion with local utilities, the hospital was allowed to let waste from the ETA flow into the waste from the rest of the hospital. Two Shelter System tents were erected within the hollow first floor to allow for care of two suspected Ebola patients at one time. The tents were designated MCU-1, which was the primary treatment area and MCU-2 was a backup tent for a second patient. It was necessary for the staff to use both MCU-1 and -2 at the same time when a couple presented as suspected Ebola patients. A vestibule on MCU-1 was used as a donning/doffing area and was able to maintain negative pressure inside the entire unit. MCU-1 also had a shower, sink, and private toilet. Air scrubber filtration and HEPA filtration were already available for each unit. The MCU-1 was stocked with emergency supplies such as a code cart, defibrillator, thermometer, and IV and lab supplies. A laboratory area was set up next to MCU-1 inside the ETA for generalized lab tests and packaging for samples to be sent out to the CDC. Other supplies were available such as x-ray, ultrasound, and surgical trays along with a neonatal warmer. Anything not stocked inside the ETA was accessible by a short walk in the ED. Closed-circuit television and computer monitors were placed inside the MCUs for monitoring of patients via the television and access to medical records through the computer. The ETA had two entrances: one for EMS to provide increased privacy to those patients arriving with advance notice, and one from the ED in case patients continued to present to the main ED unannounced. Within the ETA there was also a staff rest area and command center.



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## Limitations

Due to the location of the hospital to one of the designated CDC entry sites from West Africa during the 2014 Ebola outbreak, it was decided that access to these shelters designated for disaster response would be provided to University Hospital. Not all hospitals would have access to these mobile shelters. However, the shelters are able to be used indoors or out, and provide environmental controls as needed as long as other sites have access to utilities. University Hospital also had the benefit of having a readily built structure to place the shelters away from the main hospital and with greater ability to control privacy. Despite the access to space and shelter University Hospital reported spending almost \$1 million on the ETA for staff, equipment, and preparation. This cost for what turned out to be 12 patients could be cost-prohibitive for many hospitals. Another limitation was the ability to care for two suspected patients at a time when the outbreak affected almost 25,000 people in West Africa.

## Design Implications

The use of contained shelters to provide care and privacy for suspected Ebola patients and staff was successful at University Hospital. The ETA contained two units for patient care and separation, areas for donning and doffing, and staff workstations and a rest area. Inside the units, closed-circuit televisions allowed visibility and communication for patients and staff without needing to enter the ETA unnecessarily. The ETA was established within an existing building that already had access to utilities, and the shelters provided filtration systems. The authors suggest the use of similar shelters for the use of other diseases and disasters.

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