

Ebola Treatment Unit

This lecture is on Ebola Treatment Units (ETUs). It will focus on principles of ETU structure and function, and how they work to maximize infection prevention and control, prevent ongoing Ebola transmission, and maintain healthcare worker safety.

It is important to note this talk does not cover everything that is needed to build an ETU. Instead, we will focus today on important points to allow healthcare workers to function safely in the ETU environment.

The learning objectives for this lecture are to:

- ▶ Recognize the ETU's place in the system of safety designed to prevent transmission of Ebola
- ▶ Describe the organization design and operating principles of the ETU
- ▶ Explain staff and patient flow through the ETU
- ▶ Describe infection prevention and control practices in the ETU

Preparing Healthcare Workers to Work in Ebola Treatment Units (ETUs) in Africa

Ebola Treatment Unit

This presentation is current as of December, 2014. This presentation contains materials from Centers for Disease Control and Prevention (CDC), Médécins Sans Frontières (MSF), and World Health Organization (WHO).



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

version 12.01.2014

Learning Objectives

- Recognize the Ebola Treatment Unit's (ETU) place in the system of safety designed to prevent transmission of Ebola
- Describe the organization design and operating principles of the ETU
- Explain staff and patient flow through the ETU
- Describe infection prevention and control practices in the ETU

This presentation contains materials from CDC, MSF, and WHO

2

Ebola System of Safety

- Personal Protective Equipment (PPE)
- Buddy system
- ETU
 - Structure
 - Infection prevention and control practices and protocols
- External ETU support structure
 - Supply chain
 - Transportation
 - Communication
 - Other needs (e.g., security)

This presentation contains materials from CDC, MSF, and WHO

3

It's important to remember that healthcare worker safety relies on more than just personal protective equipment (PPE).

There are several layers of protection that surround each healthcare worker. Each layer must be functioning correctly to ensure the safety of the healthcare worker. PPE is the layer of safety closest to the worker.

The next layer is the healthcare worker's buddy. Buddies should work with each other at all times. The buddy system provides each ETU healthcare worker with an immediate back-up in case a problem arises while in PPE. The buddy also serves as a second monitor to ensure the healthcare worker doesn't miss signs of impending heat stress, fatigue, or exhaustion.

Then there is the ETU itself. The ETU is physically designed to protect staff and patients, but there are infection prevention and control practices and protocols that must be adhered to as well. We will focus on this system of safety layer in this lecture.

However, there is one more layer in the system of safety outside the ETU. The ETU itself must be supported through

- ▶ A functional supply chain,
- ▶ A transportation system for supplies, staff, and patients, and
- ▶ Good communication with the sponsoring organization, contact tracers, the Ministry of Health, and other healthcare facilities.

There may be other needs as well (for example, security).

Course Lectures and Scripts > Ebola Treatment Unit

Community acceptance is an essential component of ETU design and one of the many challenges of this epidemic. Although patient isolation is a principle of ETU operation, the term “isolation unit” should be avoided. Instead, use the term “Ebola Treatment Unit” or another term with a more positive connotation.

Additionally, messaging about ETUs should stress these are facilities where good supportive care is provided to patients with Ebola, such as medicine and nutritious food.

Along those lines, it is important to try to keep the ETU clean and comfortable for patients as much as possible and to maintain transparency. For example, most ETUs use low or mesh fences. Visitor access areas should be outside the ETU, but close enough to patient quarters so visitors can talk to patients through these fences.

Patients often feel alone and stigmatized with this disease. Within the ETU, there is no physical contact with uninfected persons and the healthcare workers surrounding them are in high-risk PPE. Therefore, visitors become especially important for patient morale. In addition, visitor areas allow community members to observe the activities within the ETU. This is important to dispel myths and rumors that can impede healthcare worker access to the community.

The ETU is designed to address the mechanism of person-to-person Ebola virus transmission. To review, the Ebola virus is present in high quantities in body fluids of symptomatic patients, such as blood, vomit, diarrhea, and saliva. Transmission occurs through direct contact with these infectious body fluids, through broken skin or unprotected mucous membranes, or through indirect contact which might happen through contaminated objects, like syringes, other medical equipment, and soiled linens.

ETU Design: Community Acceptance

- Avoid term “isolation unit,” prefer Ebola Treatment Unit
- Deliver good supportive care (e.g., medicine, food)
- Keep environment clean and comfortable
- Maintain transparency
 - Use low or mesh fences
 - Place visitor access areas outside of, but close enough to, the ETU so visitors can talk to patients
 - Improves patient morale
 - Enhances community awareness and helps dispel rumors

This presentation contains materials from CDC, MSF, and WHO

4

ETU Design: Transmission Principles

- ETU designed to address person-to-person Ebola virus transmission
- Virus presents in high quantities in body fluids of symptomatic patients (blood, vomit, diarrhea, saliva)
- Transmission through contact with infectious body fluids
 - Direct contact through broken skin or unprotected mucous membranes
 - Indirect contact with contaminated objects
 - Syringes
 - Other medical equipment
 - Soiled linens

This presentation contains materials from CDC, MSF, and WHO

5

ETU Design: Infection Prevention and Control Principles

- ETU infection prevention and control principles
 - Patient isolation
 - Sick patients heavily contaminate their immediate environments
 - ETU admission reduces community transmission and improves survival
- Patient cohort
 - Suspected patients separated from confirmed patients
- Staff and patient flow
- Waste management
- Disinfection protocols
- PPE

This presentation contains materials from CDC, MSF, and WHO

6

There are several ETU infection prevention and control principles used to control person-to-person transmission of Ebola virus within the ETU.

One of those principles is patient isolation. Sick patients with diarrhea or heavy vomiting contaminate their immediate environments, whether they are at home or in the ETU. Therefore, ETU admission not only improves patients' chances of survival, it also reduces community transmission. Once inside the ETU, patients are placed according to risk for transmitting the disease. That is, patients suspected of having Ebola are separated from patients confirmed to have Ebola, and we'll talk more about this later.

Staff and patient flow are also important regimented aspects of a well-functioning ETU, as are waste management and disinfection protocols.

PPE is also an important part of ETU design and operation. Staff need to understand which parts of the ETU pose a risk of exposure to live virus and therefore require high-risk PPE and which do not.

ETU Risk Areas

- Outside the ETU
- Low-risk zone
- High-risk zone



This presentation contains materials from CDC, MSF, and WHO

7

There are three risk areas to be aware of around the ETU: the area outside the ETU and two zones which make up the ETU -- the low-risk zone and the high-risk zone.

Course Lectures and Scripts > Ebola Treatment Unit

Before we discuss the ETU, there are several high-risk areas in the community we must not forget. In fact, these areas are just as risky, if not more risky, than the ETU because PPE might not be available. These include:

- ▶ Patients' and deceased patients' houses
- ▶ Locations where corpses are prepared for funeral ceremonies
- ▶ Morgues
- ▶ Medical labs and operating theatres
- ▶ Traditional healer venues
- ▶ Vehicles used to transport patients suspected to have Ebola
- ▶ Hospitals and other healthcare settings with poor infection prevention and control infrastructure
- ▶ Healthcare worker households used for after-hours consultations

Patient triage (or screening) occurs outside the ETU. Triage is the critical point of separating persons suspected of having Ebola from persons without Ebola. Triage is performed either before arrival at the ETU (for example, by contact tracers or at another healthcare facility), or upon arrival at the ETU.

The ETU is designed to have clearly delineated low-risk and high-risk zones with a well-defined unidirectional flow. The ETU itself is surrounded by an outer fence and divided into a low-risk zone and a high-risk zone. Note the high-risk zone is fully contained within the low-risk zone and the high-risk zone is completely surrounded by a double fence (including a border between low- and high-risk zones) or a solid wall. A transparent fence is highly recommended as it demystifies what goes on in the ETU. Each of the two zones has specific facilities and persons allowed access. I will describe each zone in detail in the next several slides.

Areas at Increased Risk Outside the ETU

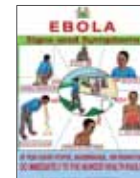
- ❑ Patients' and deceased patients' houses
- ❑ Locations where corpses are prepared for funeral ceremonies
- ❑ Morgues
- ❑ Medical labs and operating theatres
- ❑ Traditional healer venues
- ❑ Vehicles used to transport patients suspected to have Ebola
- ❑ Hospitals and other healthcare settings with poor infection prevention and control infrastructure
- ❑ Healthcare worker households used for after-hours consultations

This presentation contains materials from CDC, MSF, and WHO

8

ETU Patient Triage (Screening)

- ❑ Triage is the critical point of separating persons suspected to have Ebola from persons without Ebola
- ❑ Triage is performed before or upon arrival at the ETU

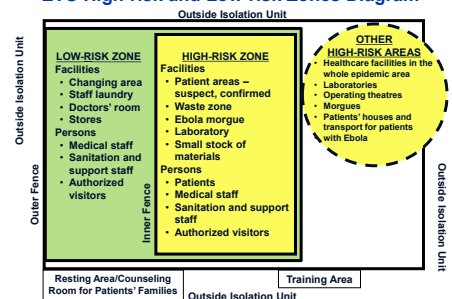


From Ministry of Health and Sanitation, Sierra Leone

This presentation contains materials from CDC, MSF, and WHO

9

ETU High-risk and Low-risk Zones Diagram



This presentation contains materials from CDC, MSF, and WHO

10

ETU Low-risk Zone

- **People allowed—STAFF ONLY**
 - Medical staff, cleaning staff, water/sanitation and logistics staff, etc.
- **Clothing needed**
 - Scrub suits, boots (no gloves in general)
- **Main activities/areas**
 - Staff entry/exit between outside and ETU
 - Changing areas for donning scrubs and/or PPE
 - Staff laundry (scrubs) and drying area
 - Storage (PPE, disinfection and cleaning supplies)
 - Pharmacy
 - Chlorine solution preparation area
 - Staff briefing room/office
- **Contamination potential**
 - If protocols followed, ideally should be none
 - Potential for contamination if uncontrolled movement of contaminated people or material

This presentation contains materials from CDC, MSF, and WHO

11

The low-risk zone is a staff-only area. This includes medical staff, cleaning staff, water and sanitation, and logistics staff. Staff should be in scrubs and boots. In general, gloves are not required but should be used if touching potentially contaminated items like the fencing.

Staff use a dedicated entrance/exit between the outer ETU area and the low-risk zone. There is a changing area to change from street clothes into scrubs and boots and a separate area for donning high-risk PPE. There is also a staff laundry facility for washing and drying scrubs, as well as drying other reusable equipment after decontamination, such as boots, goggles, and heavy-duty rubber gloves. The low-risk zone also has areas for storage, a pharmacy, a chlorine solution preparation area, and a staff briefing room, office, or doctor's room.

If protocols are followed, contamination should be minimal, and ideally none. However, the potential for contamination increases if there is uncontrolled movement of contaminated people or material within the ETU.

ETU High-risk Zone

- **People allowed—STAFF AND PATIENTS**
 - Only patients and designated staff
- **Clothing needed**
 - High-risk PPE for staff
 - Patients admitted in own clothes
- **Main activities/areas**
 - Care of patients with suspected or confirmed Ebola virus disease
 - Collection and processing of contaminated waste
 - Collection of patient specimens
 - Lab testing may be done inside the ETU or at an outside facility
- **Contamination potential**
 - **Everything contaminated**—Buildings, cots, personal belongings, paperwork, patients, and exposed PPE worn by staff

The high-risk zone is an area inside the low-risk zone (double fence)

This presentation contains materials from CDC, MSF, and WHO

12

Only patients and staff are allowed in the high-risk zone. Staff need to be in high-risk PPE. Patients are admitted to the high-risk zone in their own clothes.

The main function of the high-risk zone is to care for patients who either have or are suspected to have Ebola virus disease. The high-risk zone is also the area of the ETU for collecting, processing, and disposing of waste. Patient specimens are also collected in the high-risk zone. If the lab is located within the ETU, it is located in the high-risk zone. Otherwise, the lab might be located off-site and arrangements will need to be made for transporting specimens to the lab.

Everything in the high-risk zone—walls, floors, cots, personal belongings, paperwork, patients, and outer layer of PPE—should be considered contaminated. For this reason, and to add an extra layer of protection, the high-risk zone is an area fully contained inside the low-risk zone, either by a double fence or a solid wall.

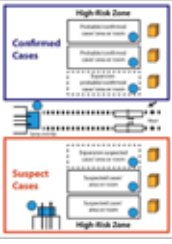
Course Lectures and Scripts > Ebola Treatment Unit

The high-risk zone itself is divided into two parts: a suspect patient area and a confirmed patient area. Separation of suspected and confirmed cases helps reduce transmission among patients if some of the patients in the suspect area are not true Ebola cases. Therefore, the flow of patients and staff always moves from the suspect area to the confirmed area, NEVER the reverse.

ETU High-risk Zone Patient Wards

- Separation of suspected and confirmed cases to reduce transmission among patients
 - Area(s)/room for suspected cases
 - Area(s)/room for confirmed cases

Flow always moves from the suspect area to the confirmed area – NEVER the reverse

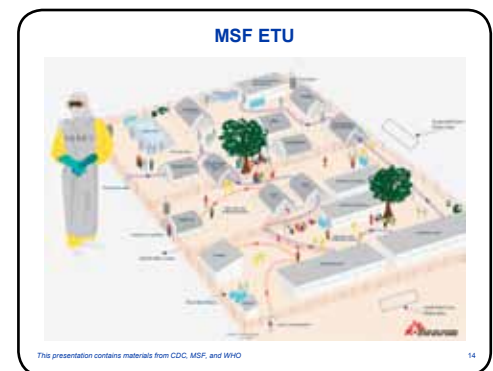


The diagram shows two zones: 'Confirmed Cases' and 'Suspect Cases'. Both zones are divided into 'High-Risk Zone' and 'Low-Risk Zone'. Arrows indicate the flow of patients and staff from the 'Suspect Cases' zone to the 'Confirmed Cases' zone, and from the 'High-Risk Zone' to the 'Low-Risk Zone' within each zone.

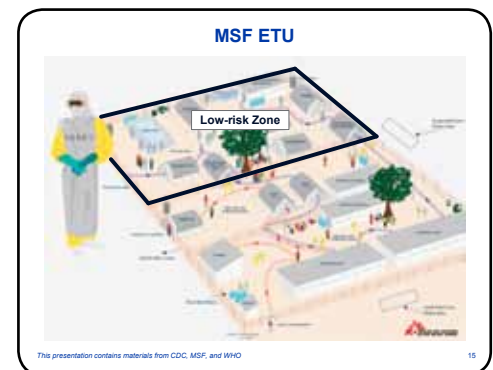
This presentation contains materials from CDC, MSF, and WHO

13

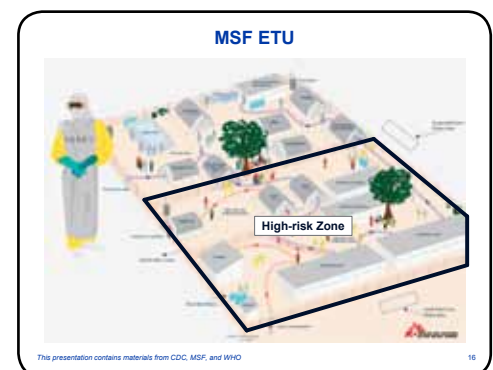
To emphasize the structure and flow of the ETU, we are going to walk through a mock Médecins Sans Frontières (MSF) ETU, first as a staff member, then as a patient. First, let's orient ourselves to this particular ETU.

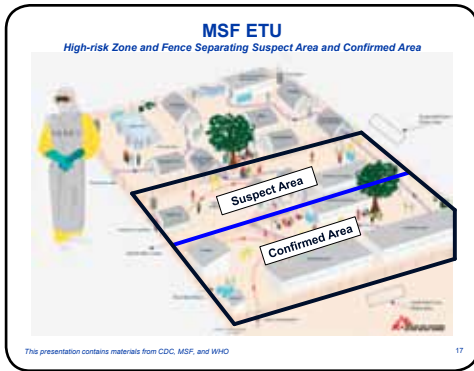


The black line outlines the double fence surrounding the low-risk zone.

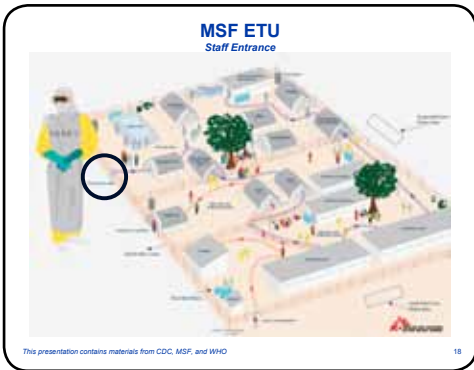


Now the black line demarcates the double fence surrounding the high-risk zone.





The blue line is on the double fence separating the suspect area from the confirmed area within the high-risk zone.



We will now follow a staff member named Henry who is coming to the ETU for his shift. Henry enters this MSF ETU through the dedicated staff entrance in the low-risk zone, indicated by the black circle. Henry enters the ETU wearing his street clothes.

MSF Requirements—Entrance to Low-risk Zone

- Low-risk Zone
 - Spray shoes with 0.5% chlorine solution
 - Perform hand hygiene
 - Change from street clothes into scrubs and boots

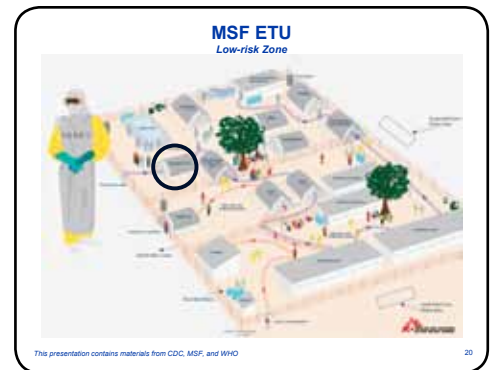


This presentation contains materials from CDC, MSF, and WHO 19

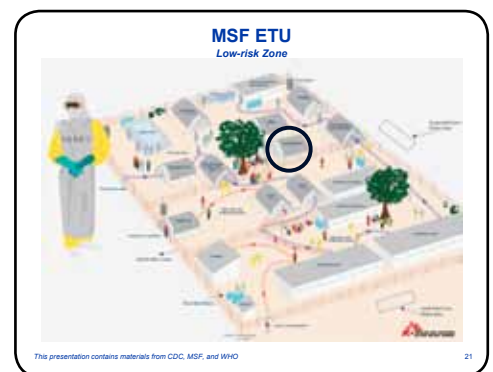
At the entrance to the low-risk zone, Henry’s street shoes are sprayed with 0.5% chlorine solution to prevent him from tracking Ebola into the ETU. He also performs hand hygiene at the entrance, either with 0.05% chlorine solution or soap and water. He then enters the low-risk zone of the ETU and proceeds to the changing area.

Course Lectures and Scripts > Ebola Treatment Unit

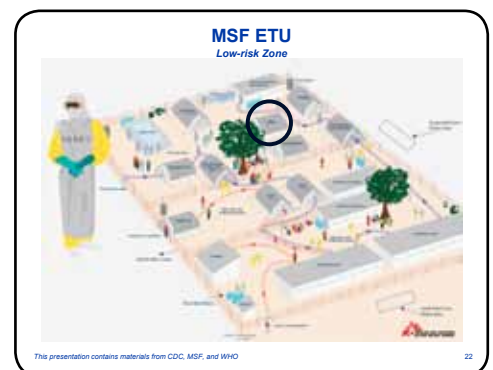
Here we see Henry proceeding to the changing area to change into his scrubs and boots.



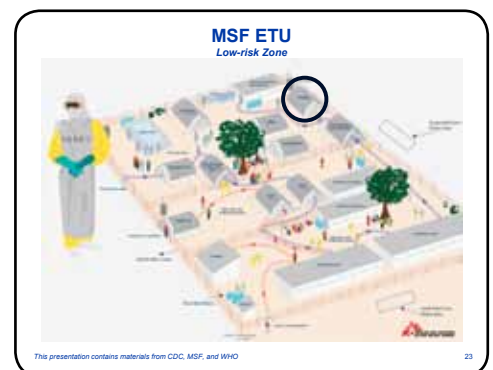
Next, he goes to the meeting tent where he meets up with his buddy and receives his shift briefing. Some of the other areas found in this low-risk zone include:



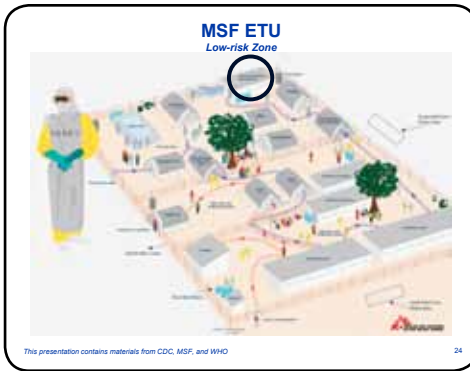
An office



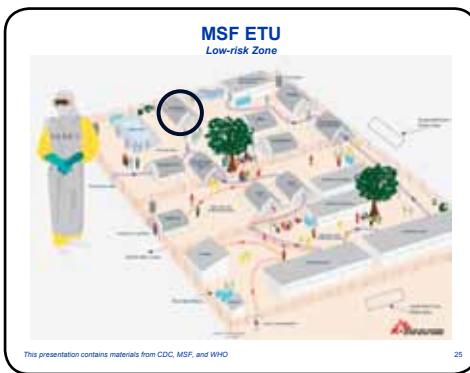
A storage area for medical supplies and PPE



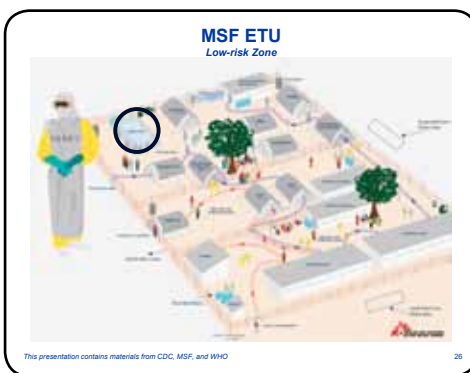
Course Lectures and Scripts > Ebola Treatment Unit



A staff laundry, where scrubs are washed and dried. Reusable items which have been decontaminated may also be dried here. Chlorine solutions may be prepared in the laundry area or in the pharmacy.



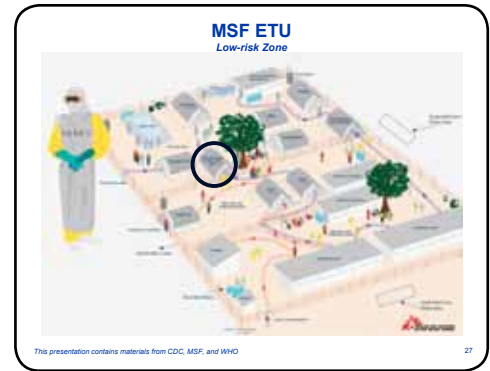
A pharmacy



And a water tank

Course Lectures and Scripts > Ebola Treatment Unit

After the briefing, Henry and his buddy then proceed to the high-risk zone donning area where they don their PPE.



As an MSF staff member, Henry dons a Tychem® suit, a fluid-resistant apron, two pairs of gloves, a N95 respirator, a hood specially made for MSF, and goggles. Your ETU might use other suit options. As you go through the ETU exercise for this course, you may notice differences in PPE. To emphasize again, the purpose of this course is to teach you infection prevention and control principles. Your ETU protocols are likely to vary some from both this slide and this course.

MSF Requirements—High-risk Zone PPE

- ❑ Suit (Tychem®)
- ❑ Apron
- ❑ Two pairs of gloves
- ❑ N95 respirator
- ❑ Hood
- ❑ Goggles



The image shows two individuals wearing full-body white Tychem suits, including hoods and gloves, standing in an outdoor setting. A small number '28' is in the bottom right corner.

Henry and his buddy then note the time and log into the high-risk zone. It is important to sign in and out of the high-risk zone because it can be easy to lose track of time. For safety reasons, you are limited in the amount of time you are in high-risk PPE. Therefore, it is important to plan your activities before entering the high-risk zone. Also, it's important for the functioning of the ETU to know which staff members are in the high-risk zone at any given time.

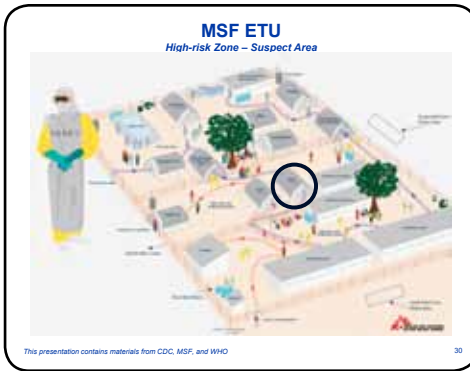
ETU Log of Healthcare Workers Entering High-risk Zone

Date	Name	Service	Time In	Time Out
11-2-09	Dr. Hoang	Infection Diseases	08:15	11:00
11-2-09	Anna Bunker	Infection Care	08:00	11:00
11-2-09	Alain Soudast	Infection Care	11:00	14:00
11-2-09	Walter	Cleaning	11:30	12:45
11-2-09	Stefanovic	Family member	11:15	

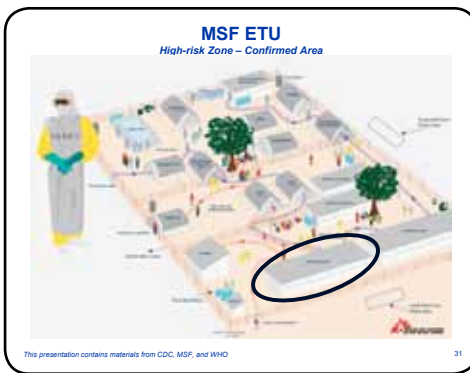
Fig. 10. An example of a sign-in sheet.

A small number '29' is in the bottom right corner.

Course Lectures and Scripts > Ebola Treatment Unit

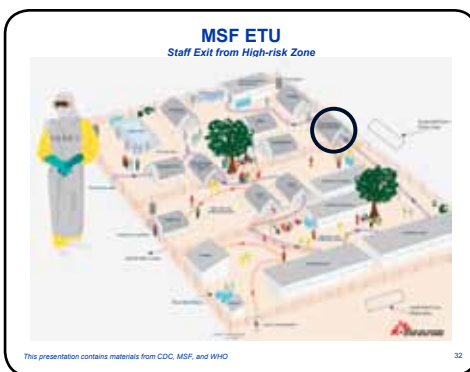


Henry and his buddy are now in the high-risk zone. Their first task is to take care of patients in the suspect area. Henry and his buddy do not forget to wash their gloved hands with 0.5% chlorine solution in between each patient, especially if they have touched anything. Also, notice Henry's hands. Holding your hands together and in front of you helps reduce contamination.



Henry and his buddy cross the fence separating the suspect and confirmed areas to care for patients with Ebola.

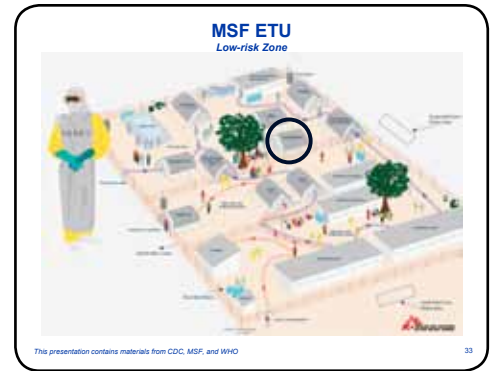
If Henry forgot his patient notes in the suspect area, what would he do? He can't go backwards from the confirmed area to the suspect area because he might contaminate a patient who does not have Ebola (remember that patients in the suspect area are waiting for lab tests and some will not have the virus). A staff member in the suspect area can bring his notes to him (and not return to the suspect area), or he could work from memory.



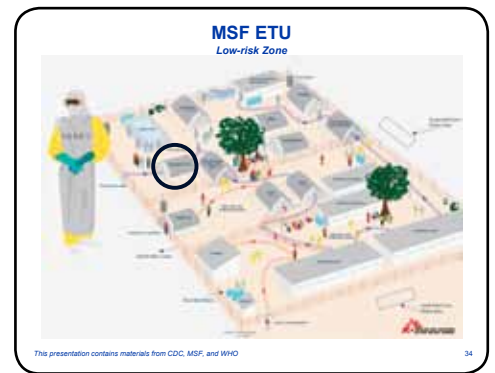
When finished, Henry and his buddy leave the high-risk zone through a staff-only exit. They doff their PPE with a doffing coach and exit back into the low-risk zone.

Course Lectures and Scripts > Ebola Treatment Unit

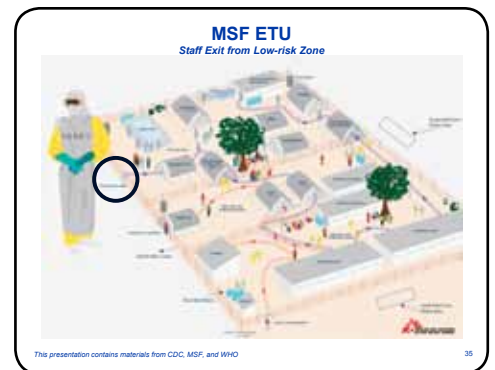
Henry and his buddy then go to the meeting tent to debrief about the shift. They will also drink plenty of water to help compensate for dehydration caused by wearing high-risk PPE.



Henry then changes back into his street clothes.

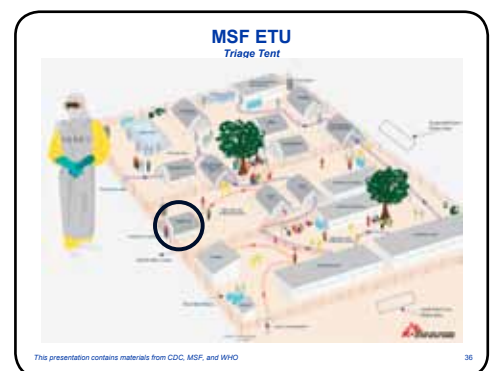


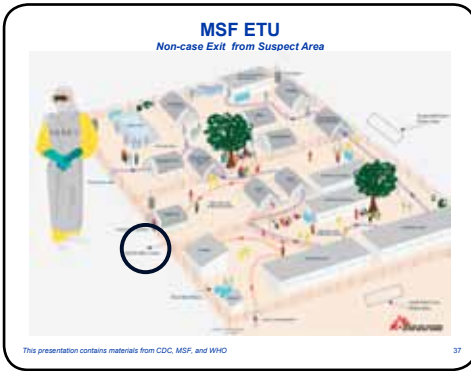
And leaves the ETU by the same way he entered.



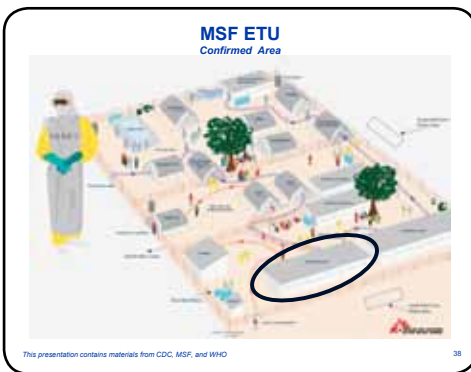
Now let's look at patient flow through the ETU.

The black circle shows the patient triage area. If a patient is suspected of having Ebola, that patient enters the ETU directly into the suspect area of the high-risk zone.

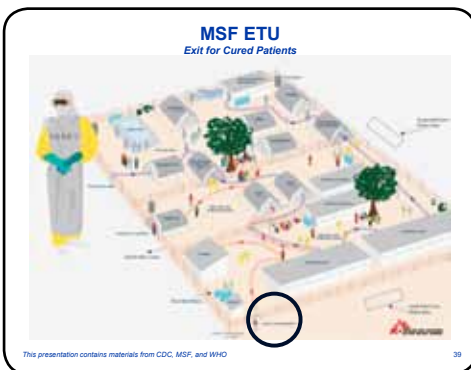




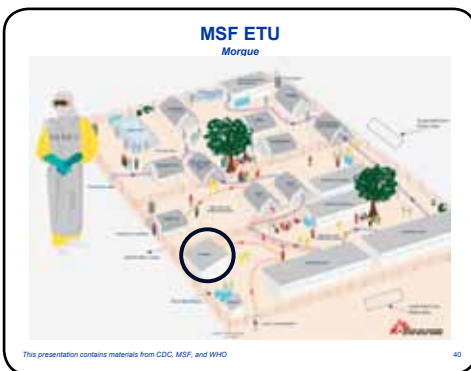
If the patient tests negative by RT-PCR AND it's been three or more days since the onset of symptoms, the patient is NOT an Ebola case and needs to be discharged. The patient showers in 0.05% chlorine solution, and receives new clothes and shoes to replace the old clothes and shoes that have been incinerated. The patient then exits from the suspect area through a one-way dedicated patient exit, shown by the black circle.



If the patient's PCR test is positive for Ebola virus disease, the patient is moved into the confirmed area of the high-risk zone.

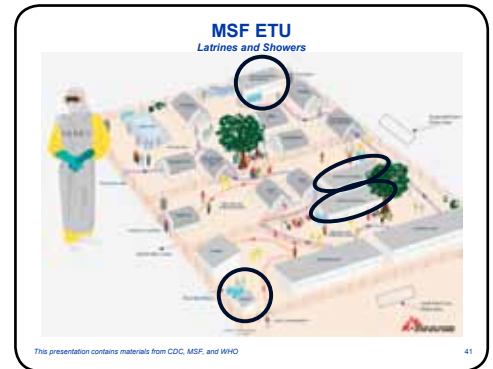


A patient with Ebola who gets better AND tests negative by PCR is discharged through a one-way dedicated patient exit in the confirmed area, shown by the black circle. Before leaving, the patient showers and receives new clothes and shoes. The patient's old clothes and shoes are incinerated.



A patient with Ebola who dies is taken to the morgue. The morgue is always in the confirmed area of the high-risk zone and has a protected exit for collection of body bags by burial teams.

Notice the latrines and showers are separated for staff (in the low-risk zone), patients in the suspect and confirmed areas, and cured patients (in the high-risk zone).



As Henry and the patient demonstrated, fences or walls are needed to mark the borders of the different ETU zones. The high-risk zone should be physically separated from the low-risk zone using double fencing or existing walls. Ideally, there should be no solid walls between low and high risk in order to be able to monitor patients in the high-risk zone. Such separation prevents uncontrolled movement between zones.

ETU Partitions/Physical Barriers

- ❑ Fences or walls mark borders of the ETU zones
- ❑ High-risk zone should be physically separated from low-risk zone using double fencing or existing walls
- ❑ Separation prevents uncontrolled movement between zones



In addition, the separation between zones needs to be well marked and understandable.

Signage

- ❑ Separation between zones needs to be well marked and understandable



ETU Entrances and Exits

Designed to Isolate High-risk Zone (1 of 2)

□ Entering the ETU from outside

- **Suspected cases** enter directly into high-risk zone from triage area through one-way entrance
 - Caregivers accompanying patients are not admitted
 - Persons evaluated and not admitted leave from triage area
- **Staff** enter ETU through low-risk zone using separate staff-only entrance/exit
 - Disinfection on arrival

This presentation contains materials from CDC, MSF, and WHO

44

Entrances and exits need to be separated and controlled in order to isolate the high-risk zone.

Patients and staff enter the ETU from the outside using different routes/zones. Patients with suspected Ebola enter directly into the high-risk zone from the triage area through a one-way entrance. Any caregivers, family, or friends who accompany them are not admitted. Persons who are evaluated by ETU staff, but are determined not to have Ebola (and therefore, not admitted to the ETU), leave from the triage area.

In contrast, staff enter the ETU through the low-risk zone using a separate, staff-only entrance/exit. Staff members undergo disinfection on arrival by washing their hands either with 0.05% chlorine solution or with soap and water, and by spraying their shoes with 0.5% chlorine solution.

ETU Entrances and Exits

Designed to Isolate High-risk Zone (2 of 2)

□ Leaving the ETU

- **Discharged patients** leave through dedicated one-way exits
 - Non-cases through suspect area and cured patients through confirmed area
 - Disinfection is done as discharged patient leaves
- **Staff** exit ETU from low-risk zone using separate staff-only entrance/exit
 - Disinfection on departure

This presentation contains materials from CDC, MSF, and WHO

45

Discharged patients leave the ETU through dedicated one-way exits. Patients without Ebola exit through the suspect area after taking chlorine showers and changing into new clothes. Cured patients exit through the confirmed area after undergoing the same decontamination procedure.

Staff exit the ETU to the outside from the low-risk zone. This is a separate staff-only exit, generally the one through which they entered. As staff exit, they also undergo disinfection. They perform hand hygiene and their shoes are sprayed with 0.5% chlorine solution.

Staff Movement Inside the ETU

□ Movement between low-risk zone and high-risk zone

- Only staff enter low-risk zone—no patients or other people
- One-way staff-only passage from low-risk zone to high-risk zone
 - Staff **don** PPE in low-risk zone before moving to high-risk zone
- Separate one-way staff-only passage from high-risk zone back to low-risk zone
 - Staff **doff** PPE before re-entering low-risk zone

□ Movement within the high-risk zone

- **Always** move from suspect area → confirmed area
- **Never** move from confirmed area → suspect area

This presentation contains materials from CDC, MSF, and WHO

46

Staff and patient movement inside the ETU is also important to isolate the high-risk zone. Movement always flows from lowest risk to highest risk. Staff members enter the ETU in the low-risk zone, which is a staff-only area. No patients or other people should be in the low-risk zone. There is a one-way staff-only passage from the low-risk zone to the high-risk zone. Staff members don PPE in the low-risk zone before moving into the high-risk zone. Then there is a separate one-way staff-only passage from the high-risk zone back to the low-risk zone. Here, staff members doff their PPE before re-entering the low-risk zone. Within the high-risk zone, movement is also from lower risk to higher risk. Staff always move from the suspect

area to the confirmed area, never the other way.

Patients also move from lowest risk to highest risk, but their movements are confined to the high-risk zone since no patients are allowed in the low-risk zone. Once admitted to the suspect area, patients move to the confirmed area only if they have a positive lab test for Ebola virus.

Patient Movement Inside the ETU

- All patients confined to high-risk zone
- Patients admitted to suspect area move to confirmed area **ONLY** if they have a positive lab test for Ebola virus

This presentation contains materials from CDC, MSF, and WHO

47

Along with the ETU structure and function, ETU disinfection is an important component of the infection prevention and control practices that support the system of safety. There are two different concentrations of chlorine solutions used for different purposes throughout the ETU: 0.5% and 0.05%. The 0.5% chlorine solution is a strong caustic solution. Avoid direct contact with skin and eyes. This chlorine solution should be used to disinfect infectious body fluids, such as vomit, diarrhea, and blood, as well as corpses, toilets, gloved hands, floors, beds, and mattress covers. The 0.05% chlorine solution can be used to disinfect bare hands and other living skin, thermometers and medical equipment, staff laundry (such as scrubs, since 0.5% is very harsh on linens), and plates, cups, and eating utensils used by patients and kept in the high-risk zone.

ETU Disinfection

- Two different chlorine solutions are used for different purposes
- 0.5% chlorine solution

Note: 0.5% chlorine is a strong caustic solution. Avoid direct contact with skin and eyes

- Body fluids, excreta, vomit, etc.
 - Corpses
 - Toilets and bathrooms
 - Gloved hands
 - Floors
 - Beds and mattress covers
- 0.05% chlorine solution
 - Bare hands and other skin
 - Thermometers
 - Staff laundry
 - Plates, cups, eating utensils

This presentation contains materials from CDC, MSF, and WHO

48

All waste from the ETU's high-risk zone should be treated as if it is highly contaminated. Waste must be safely collected, handled, transported, and disposed of properly. Staff involved in the management of waste must wear high-risk PPE with additional protection for waste management. Waste can be divided into burnable waste, liquid waste, organic waste, sharps, and waste water.

Waste Management

- All waste from the ETU high-risk zone should be treated as if highly contaminated
 - Waste must be safely collected, handled, transported, and disposed of properly
- Staff involved in the management of waste must wear high-risk PPE with additional protection for waste management
- Waste can be divided into burnable waste, liquid waste, organic waste, sharps, and waste water

This presentation contains materials from CDC, MSF, and WHO

49

Summary

- The ETU main function is to keep high-risk patients and activities in one area
 - High-risk PPE for staff
 - Stringent environmental controls
- ETU staff and patient movements always proceed from lower-risk to higher-risk areas—Never reverse this flow
- ETU infection prevention and control practices should be consistent and unvarying regardless of sponsor (e.g., WHO, MSF)

This presentation contains materials from CDC, MSF, and WHO

90

In summary, the main function of the ETU is to keep high-risk patients and activities in one area. The high-risk zone requires special infection prevention and control practices, including high-risk PPE for staff and stringent environmental controls. ETU staff and patient movements always proceed from lower-risk to higher-risk areas—Never reverse this flow. ETU infection prevention and control practices should be consistent and unvarying regardless of the sponsoring organization.

<http://www.cdc.gov/vhf/ebola>

For more information please contact Centers for Disease Control and Prevention



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

PHOTO BY THE LETTERS OF LINDSEY LINDSEY AND PREVENTION