Transport of EVD cases
Objectives

• Review Ebola Virus transmission routes and identify those relevant to transport of EVD cases
• Review EVD case definitions and what they mean for transportation
• Highlight the need to have systems and resources in place prior to deployment
• List and describe the components of the service needed to transport EVD cases safely pre-hospital and between facilities
• Highlight the need for a national policy that guides and supports safe and timely transport of EVD patients
Transmission of Ebolavirus: in the community

• In the community transmission typically requires direct physical contact with
  – i) a dead body of a EVD case or
  – ii) an EVD case or
  – iii) possibly items contaminated by body fluids from an EVD case

• Ambulance crews have a community role with EVD even now in the Philippines (different from most other HCWs)
Transmission of Ebolavirus: in the hospital

• In the hospital the same applies, but transmission may also occur:
  – i) by needlestick
  – ii) by droplet infection (within 0.5-1 m of a patient) or
  – iii) in theory by procedures that generate aerosols of infected fluid (e.g., intubation, ventilation, etc.)

• Ambulance crews face the same risks as other HCWs and must follow the same protocols to keep themselves safe
EVD case definitions

• Person under investigation (PUI) = a person who has been in a country with ongoing ebola transmission within the last 21 days
• Suspect case = a PUI who has signs and symptoms consistent with EVD
• Probable case = a suspect case with an epidemiological link to a confirmed EVD case
• Confirmed case = a person who has a positive ebola laboratory test
Relevance of the EVD case definitions

- **PUI** = no symptoms, **not infectious**
- **Suspect case** = If the person truly has EVD, the case is infectious; most suspect cases in the Philippines will likely not be Ebola, but falciparum malaria
- **Probable case** = much more likely to be a true case of EVD; infectious
- **Confirmed case** = definitely infectious
- Suspect, probable and confirmed cases have to be managed using EVD infection control protocols
Reasons for transporting EVD cases

Moving EVD cases between health facilities

• Case can not be safely managed at current location
• Better care available at receiving hospital
  – Current referral hospitals are RITM and St Lazaro
• Hospital that diagnoses EVD case “refuses” to accept the case

Moving EVD cases from community to hospital

• PUI in home quarantine develops symptoms (ie, becomes a suspect EVD case) and needs safe management
• EVD case identified at home, needs hospitalisation
• Suspect case abandoned on street; called out by public
Where is an EVD case best treated?

- Cases do better with specialized and experienced support.
- Will an EVD case have a better outcome treated in a local hospital with imported specialized support or if moved to a specialized hospital remote from the case?
- Will the negatives of transport be outweighed by the benefits of specialized treatment?
- Role for a Rapid Response Team to go to peripheral hospitals to provide support where the patient is?
List of topics relevant to the ambulance service at a hospital

1. Planning and preparation
2. Screening cases and calls
3. Preparing to transport an EVD case
4. Transporting an EVD case
5. Immediate post-transport activities
6. Post-transport evaluation
Planning and Preparation

- Development of protocols and Standard Operating Procedures (SOPs)
- Identifying vehicles and crew
- Obtaining and prepositioning supplies
- Training crews
  - Infection control for EVD
  - Transporting EVD patients
  - Preparation for transport
  - Decontamination of ambulance
Identifying vehicles

• Does each hospital need to identify its own transport vehicle or will DOH or groups of hospitals identify a vehicle to be used across a region?

• Essential characteristic:
  – Driver is separated from patient
  – Permanent (structural) or temporary (plastic sheet)

• Assume vehicle will be not available for routine use for at least 1 day after transporting an EVD patient

• This is not for infection control reasons, but because of the time involved in all procedures
Possible types of vehicles

• Pickup – used in West Africa
  – Add cover to protect patients and staff in back

• Ambulance
  – Basic
  – Sophisticated
What could be used in Philippines?

- Pickup – yes
- Ambulance
  - Basic – yes
  - Sophisticated – probably misuse of a scarce resource since complex procedures will not be performed on EVD cases and the ambulance is better used for other cases
- Other
  - Jeepney?
Jeepney as an ambulance for EVD case

• Easy to disinfect
• Could be a dedicated vehicle
• Needs to have barrier between driver and patient compartments

http://www.boardinggate101.com/2012/08/jeepney.html
http://cheekeegirl.blogspot.com/2014/04/philippines-e-jeepney.html
Screening cases and calls

Routine cases
- Determine the likelihood of a routine case having EVD
- Travel history – *Been in a country with EVD in last 21 days?*

Ebola cases
- Determine the category (only 2 in practice) – PUI, OR suspect / probable / confirmed

Severity of case
- Too ill to move? Refuses to be transported?
- Wet = liable to contaminate ambulance (e.g., diarrhea, vomiting, bleeding)
- Dry = low risk of contamination
To move EVD case or not?

- Should be based on expert clinical assessment of risk factors
- Will the patient benefit?
- Is the patient too ill?
- Will transfer take too long (>2 hrs)?
  - Heat stress is a safety issue in PPE
  - Patient welfare
- Is the transfer too hazardous to staff?

Who decides and how? Good to have this clearly established prior to transport (SOP)
Preparing to transport a particular case

- Personal protection
- Preparation of the ambulance
- Preparation of the stretcher
- Equipment for attending HCW
- Supplies for driver
PPE for transport

- **Paramedics** (2 per trip) (if possible)
  - Full PPE for both
  - Have at least 2 spare sets available for both

- **Driver** (1 per trip)
  - Does not need full PPE while driving
  - However, have spare set of full PPE available
  - Driver can act as Trained Observer; so needs Trained Observer’s PPE when supervising donning/doffing

- **Patient**
  - Should wear surgical mask to stop droplets
  - If “wet” case, may consider putting patient in coverall to limit environmental contamination

- **Ancillary items**
  - All items needed to ensure safety when donning/doffing PPE
  - Cleaning up visible contamination
  - Decontamination of ambulance
Preparation of the ambulance

• **Essential** – Separate driver’s compartment from patient’s compartment
• Put up plastic sheeting as minimum temporary measure
• Remove unnecessary items
• Does the patient compartment need to be lined with plastic sheeting?
Plastic sheeting: To line or not to line?

• The reason for lining with plastic sheeting is if the ambulance has a complex interior that would be difficult to disinfect; i.e., inbuilt cupboards, seats with non-washable material, many nooks and crannies

• If the ambulance has a simple interior (like an empty box) and can be easily disinfected, no need to line with plastic sheeting

• Lining takes time to put up (an hour or more); time to remove safely (30 mins); adds cost
Lining with plastic sheeting

- Line the patient compartment with plastic sheeting (impermeable to liquid)
- Try to make the floor and 10 cm up wall a single sheet (to contain fluids on the floor)
- Fix in place with duct tape – double tape all seams – inside and on the other side
- Let floor structures (for stretcher) protrude through plastic
- Do not cover entry door
- Consider including vertical slits at windows to allow ventilation (plastic will need to be taped to front and back of window space)
- Put medical items that may be required into plastic bags that can be decontaminated if not used
Ambulance lined with plastic sheeting
RITM Ambulance: connection between driver and patient now closed
RITM ambulance 2: plastic sheeting covers cupboards
Prepare the stretcher

- If stretcher is basic, no preparation needed
- If it has a mattress, cover with plastic sheeting
This mattress can be decontaminated with 0.5% chlorine – no plastic cover needed
Preparing to transport an EVD case: crew

- Three crew (two paramedics, one driver)
- Skills and experience
  - Clinical experience for paramedics
  - Driver – must have been trained as a Trained Observer
- Training
  - Infection control for EVD
  - Transporting EVD patients
  - Preparation for transport
  - Decontamination of ambulance
Preparing to transport an EVD case: logistics

• Inform and collaborate
  – Have medical supervisor involved in decision to move an EVD case
  – Ensure that there is communication between sending and receiving medical teams
  – Follow the SOPs (if there are some)

• Back up ambulance
  – Decide if this is needed
  – Incidents, including accidents, have health and reputational risks

• Police assistance
  – Needed to help with traffic?
Backup ambulance – USA – EVD case
Airport to Emory Hospital, Georgia
Prepare for the worst!

Backup ambulance should have:

- Additional paramedics
- Full sets of PPE
- Equipment to decontaminate a crash scene
- Items to cordon off area
- Maybe an attending physician

What is the role for police or security?
Transporting an EVD case

- Collection of patient
- Assessment of likelihood of contamination of crew and vehicle (wet / dry case)
- Containment of excretions
- Safety of crew during transport
- Clinical activities during transport
- Communications during transport
- Arrival at receiving facility
- Handover
Collecting EVD patient

• The route to the ambulance area from the patient’s location at the dispatch hospital must be able to be controlled and secured, and wide enough to permit transfer of patient, staff, and equipment
• Usually do not use Emergency Department but collect from Isolation Unit
• Receive patient with paramedic involved wearing full PPE
• If mobile case, use one paramedic
• If stretcher case, will need two
• Any person who had direct contact with the case, should not enter the driver’s compartment, but should stay with patient
Safety of crew

- One paramedic needs to be with patient
- If patient’s condition is unstable, two paramedics may be needed with patient
- Other paramedic could be on standby in driver’s cab, but should not have had any patient contact
- No major interventions should be done
- No procedures involving sharps
- Clean up visible contamination as soon as it occurs if possible
- Paramedic with patient needs to be able to communicate with others
Driver – what PPE?

- Driver’s compartment is separate from patient compartment
- Risk of exposure is minimal
- **Prime requirement** – Any PPE worn by driver must not reduce safety of driving
- More of a psychological issue than a biological one
- Coveralls, one pair of gloves, mask?
Handover at receiving facility

- For suspect/confirmed EVD case only handover patient to staff wearing full Ebola PPE
Immediate post-transport activities

• Safe doffing of PPE
  – Where?
  – At receiving facility?
  – Follow the doffing protocol – driver as Trained Observer

• Managing wastes
  – At receiving facility?
  – To return in ambulance?

• Ambulance decontamination
  – At depot or at receiving facility?

• Debriefing of crew
Sequence of decontamination

- Doff PPE used during transport
- Use plastic sheeting as a high risk area for doffing
- Dispose of used PPE safely
- Disinfect or dispose of sheet
- Don new PPE
- Clean and decontaminate ambulance
- Dispose of waste
- Doff PPE
- Dispose of used PPE safely
Decontamination vehicle

- Wear full Ebola PPE
- Soak visible contamination with 0.5% bleach or other approved disinfectant
- Wipe this up after 10 minutes
- Clean the plastic sheeting with 0.5% bleach or other approved disinfectant
- Remove the plastic sheeting and put into waste bags or onto an impermeable waste sheet that is folded and secured
- Clean the interior of the ambulance with 0.5% bleach or other approved disinfectant
- Clean the outside of the ambulance with 0.5% bleach or other approved disinfectant
Removing the plastic sheeting

- Interior of plastic sheeting is decontaminated
- In removal the aim is to roll the sheeting in on itself (clean side out; side that had contact with patient inside)
- Start at the edges near the back entry door
- Remove from walls and roof, rolling them inwards
Almost finished:
still attached on right wall
Ready to be decontaminated and discarded
Post-transport evaluation

• Evaluation of performance
  – Did it work?
  – Can it be improved

• Modification of SOPs if indicated

SOPs would make the transfer just described safer and less stressful for all involved
Transport by air

- When will patients be transported by air?
- CDC have developed a protocol
- Isopod may be used
Guiding Principles for Transport of EDV cases

• The decision to transport an EVD patient must be based on expert clinical risk assessment
• The appropriate transport mode and vehicle type should be determined by expert risk assessment
• Staff and others who might be exposed to the patient during the journey should wear appropriate PPE, and should be subject to health surveillance after the journey if the patient is a confirmed EVD case
• The ambulance and any fixed equipment used must be able to be effectively decontaminated with an approved disinfectant
• The ambulance crew must be trained in the protocol for transport of EVD patients

Based on Bannister et al (2009)
Guiding Principles for Transport of EDV cases (cont.)

• The ambulance should have an external, securable, area for parking and decontamination, and procedures for safe decontamination of ambulance equipment, including safe storage before decontamination.

• The route from the ambulance area to the unit entrance at both dispatch and receiving hospitals must be able to be controlled and secured, and wide enough to permit transfer of patient, staff, and equipment.

• An ambulance used to transport an EVD patient should not be returned to normal use until the vehicle has been decontaminated.
Operational questions: DOH policy and guidelines in preparation

• Who is in overall control of transporting EVD cases?
• Who decides if a patient should or should not be transported?
• Who organises the transport?
• Who pays the cost?
• Who organises police escort to assist with travel in heavy traffic?
References


