Ebola:
Protection and Preparedness for the EMS Provider

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North Shore LIJ

NQF National Quality Forum | National Quality Healthcare Award Winner 2010

Ebola- What We Know?

- As of October 15
  - Total Cases- 9216
  - Laboratory Confirmed Cases- 5006
  - Total Deaths- 4493 (Approx. 50%)
  - 423 Health Care Workers- 55% Fatality Rate
- Impacted Countries- West Africa
  - Guinea
  - Sierra Leone
  - Liberia
  - Nigeria/Senegal- No New Cases since 09/05/14
  - Est. 150 people/day from endemic areas via air travel to US

Ebola

- Filovirus- Marburg and Ebola
- AKA- Hemorrhagic Fever Virus
- First Recognized in 1967
  - Current Outbreak- Zaire Species
- Disease Progression
  - Coagulation Defects
  - Capillary Leak
  - Fulminant Shock
- Case fatality rate- 40-90%

Ebola

- Sudden onset of fever and malaise
- Non specific signs of myalgia, headache, vomiting, and diarrhea
- Severe Forms- hemorrhagic symptoms and multi organ dysfunction including liver damage, renal failure, and CNS involvement
- Shock and Death
- Incubation typically 8-10 days (Range 2-21 Days)

Transmission

- Ingestion, inhalation, or passage through breaks in the skin
- Initial outbreak is typically from infected wildlife to humans
- Auto innoculation through eyes/mouth from ones own hands
- Direct contact of broken skin or unprotected mucous membranes from virus containing individual

Transmission

- Most infectious- blood, feces, and vomit
  - Urine, semen, breast milk, tears, and breast milk
- May live outside body for hours to several days
  - Multiple reported cases of transmission during post mortem care and post mortem ‘ritual washings’
- Airborne transmission is rare but aerosolization during medical procedures might increase risk- health care workers

Patient Identification

- Fever- >38.0C or 100.4F (new) **And/Or**
- Headache, myalgia, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage
- **AND Epidemiologic Risks within past 21 days**
- Contact with blood/body fluid of known or suspected EVD patient
- Residence in or travel to and area where EVD is active

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Patient Identification

- Handling of bats, rodents, or primates from endemic areas
- Individuals who eat bush meat or have animal rituals in endemic areas
- Individuals who participated in funeral rites or post mortem care in endemic areas without personal protective equipment (PPE)
- Blood body fluid- membrane exposure with known or suspected EVD patients without PPE

Patient Identification

- Malaria symptoms mimic Ebola

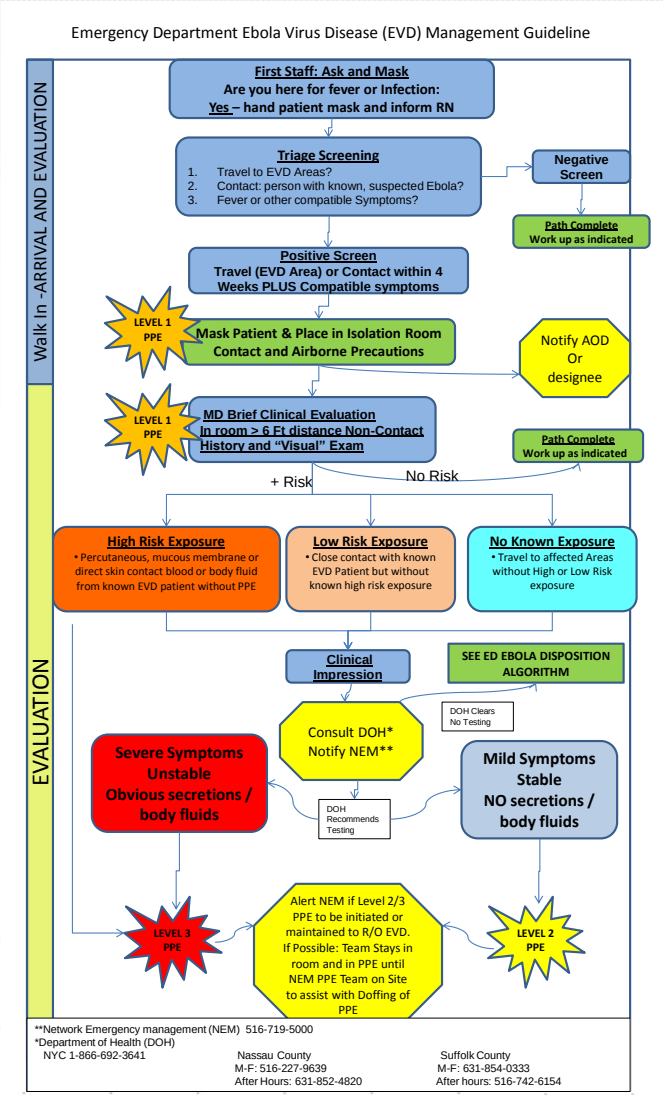
North Shore LIJ Health System Plan

- Ebola Center of Excellence
- Provide leadership
- Ensure the safety of patients, employees, and emergency medical services (EMS) personnel
- Coordination of care and resources across all hospitals, ambulatory care centers, and office based settings
- All Hospital Emergency Departments are prepared to recognize and accept patients

North Shore Health System Plan

- Education
- Personal Protective Equipment (PPE)/Training
- Employee Surveillance
- Coordination with DOH
- This is a work in progress!!!

Ebola Decision Tree



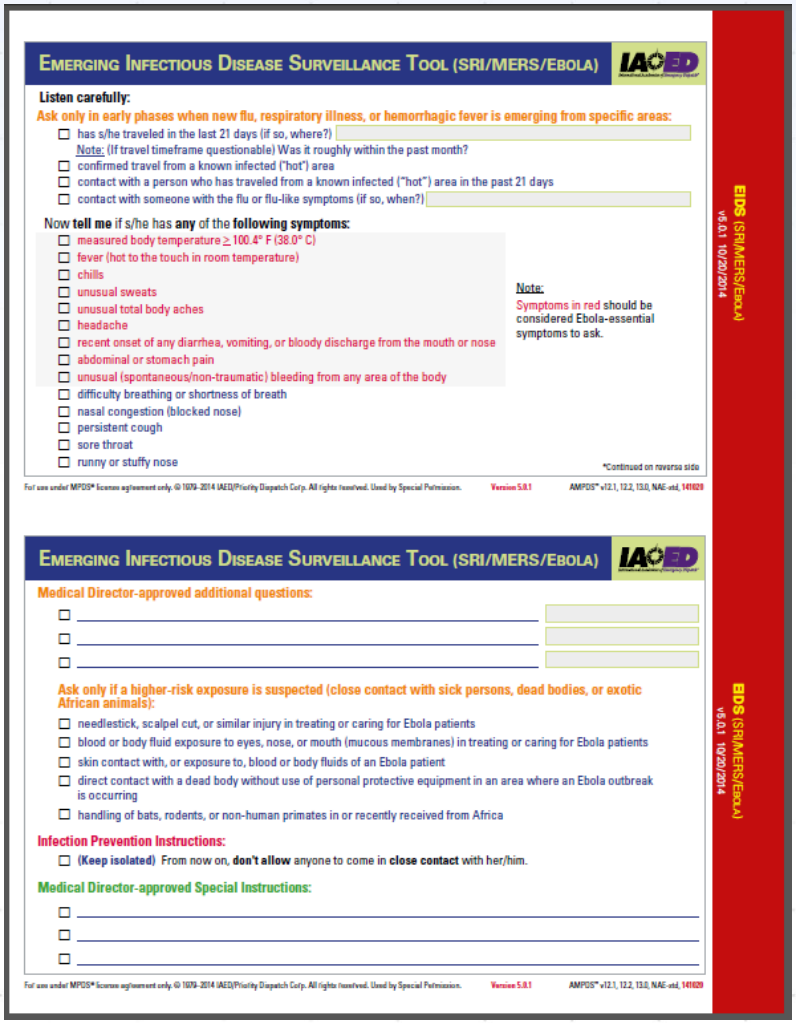
Operations

- Dispatch Screening
- Equipment - “The Ebola Box”
- Ambulance Preparation
- Care in the Field
- Transfer of Care to the Emergency Department
- Post Call

Dispatch Screening

- EMD Chief Complaint Protocol Triggers
  - Abd Pain, HA, Shortness of breath, Non Traumatic Bleeding, Chest Pain, Sick Person or ILI Symptoms
- Triggers use of Emerging Infectious Disease Surveillance (EIDS) tool
- Allows Emergency Medical Dispatch to screen callers prior to arrival of public safety responders
  - Positive screening requires all assets to stage
  - Automatic supervisor response
  - PPE Level I / II required prior to scene entry

EIDS Tool



EMERGING INFECTIOUS DISEASE SURVEILLANCE TOOL (SRI/MERS/EBOLA)

Listen carefully:

Ask only in early phases when new flu, respiratory illness, or hemorrhagic fever is emerging from specific areas:

- ☐ has s/he traveled in the last 21 days (if so, where?)

  Note: (If travel timeframe questionable) Was it roughly within the past month?
- ☐ confirmed travel from a known infected ("hot") area
- ☐ contact with a person who has traveled from a known infected ("hot") area in the past 21 days
- ☐ contact with someone with the flu or flu-like symptoms (if so, when?)

Now **tell me** if s/he has **any** of the **following symptoms:**

- ☐ measured body temperature ≥ 100.4° F (38.0° C)
- ☐ fever (hot to the touch in room temperature)
- ☐ chills
- ☐ unusual sweats
- ☐ unusual total body aches
- ☐ headache
- ☐ recent onset of any diarrhea, vomiting, or bloody discharge from the mouth or nose
- ☐ abdominal or stomach pain
- ☐ unusual (spontaneous/non-traumatic) bleeding from any area of the body
- ☐ difficulty breathing or shortness of breath
- ☐ nasal congestion (blocked nose)
- ☐ persistent cough
- ☐ sore throat
- ☐ runny or stuffy nose

Note:
Symptoms in red should be considered Ebola-essential symptoms to ask.

*Continued on reverse side

EIDS (SRI/MERS/Ebola) v5.0.1 10/20/2014

EMERGING INFECTIOUS DISEASE SURVEILLANCE TOOL (SRI/MERS/EBOLA)

Medical Director-approved additional questions:

- ☐ _____
- ☐ _____
- ☐ _____

Ask only if a higher-risk exposure is suspected (close contact with sick persons, dead bodies, or exotic African animals):

- ☐ needlestick, scalpel cut, or similar injury in treating or caring for Ebola patients
- ☐ blood or body fluid exposure to eyes, nose, or mouth (mucous membranes) in treating or caring for Ebola patients
- ☐ skin contact with, or exposure to, blood or body fluids of an Ebola patient
- ☐ direct contact with a dead body without use of personal protective equipment in an area where an Ebola outbreak is occurring
- ☐ handling of bats, rodents, or non-human primates in or recently received from Africa

Infection Prevention Instructions:

- ☐ **(Keep isolated)** From now on, **don't allow** anyone to come in **close contact** with her/him.

Medical Director-approved Special Instructions:

- ☐ _____
- ☐ _____
- ☐ _____

EDS (SRI/MERS/Ebola) v5.0.1 10/20/2014

Screening Tool from IAED

Available for free at:

http://www.emergencydispatch.org/ebola-software-and-card-updates

Equipment- “The Ebola Box”

- Level 1 PPE- Low Risk Contact and no visible blood or body fluid
  - Impervious Gown
  - Mask
  - Goggles or Face Shield
  - Gloves

Equipment

- Level 2 PPE- Visible blood or body fluid or low risk contact in the isolation room.
  - Foot and leg covers
  - 2 Pairs of gloves- Nitrile/inner and outer
  - Impervious gown or Tyvek type suit (Tychem Level F)
    - Not all Tyvek is created equal/1671 BBP rating
  - N 95 Respirator Mask
  - Goggles and face shield
  - Fluid resistant head and neck cover
  - Red bag

Equipment

- Level 3 PPE- High risk exposure related to copious secretions, long periods of contact due to care needs, or performing an invasive procedure.
  - Protective Tyvek Suit
  - Foot and Leg Covers
  - 2 Pairs of Gloves- Nitrile/inner and outer
  - PAPR- Powered Air Purified Respirator
  - PAPR hood
  - Tape

Equipment

- Face mask for patient
- Impervious disposable blankets
- Shroud/body bag
- Tracking forms
- Heavy plastic sheeting
- Tape
- Water/Bleach (10/1)- Spray Bottle or Wipes with an Environmental Protection Agency (EPA)- approved disinfectant
- Red bags

Ambulance Preparation

- Strip all non essential equipment
  - May require additional vehicle/side cabinetry
  - Wrap in plastic all those items that cannot be removed
- Plastic Draping
  - Isolate patient compartment from cab
  - Cover all rails/cabinets/vent
  - Create a “Containment Bowl”

Ambulance Preparation



Ambulance Preparation



Which Model Do You Prefer?
EMS Draping 101





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Care in the Field

- Pre Arrival Screening is key!!!!
  - Don’t rely on 100%
- Ask and Mask
- Wrap the patient/use of shroud
- No invasive procedures
- Avoid aerosolization
- FOCUS is Basic Life Support
  - Limit Venipunctures/IV

Transport

- Avoid taking patient belongings
  - Risk for contamination
- No passengers other than PPE donned medical personnel
  - Except Pediatric Patient- Need parent/guardian
- All crew involved in care – Transport in the back
- Provider not involved in Patient Care drives ambulance

Transfer of Care- Emergency Department

- Pre Arrival Notification
  - Emergency Department Preparation
- Crew and patient Do NOT enter facility upon arrival
- Hospital staff donned in PPE
  - Initial patient assessment at ambulance- 6 feet
  - They will bring patient into Emerg Department- draped
  - Crew waits outside for further instruction

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Emergency Department

- Will assess patient and make Department of Health Contact (DOH)
  - Risk assessment
  - NO Laboratory specimens/IVs until DOH contact- Limit needle sticks
  - Follow up with EMS crew with regards to risk assessment and need for decontamination of vehicle, equipment, and personnel

- Disposal of PPE and Linens
  - Sheets- Left in room/red bag with Patient
  - Crew PPE and disposables- Left in red bag outside Emergency Department. Use of canisters.

Doffing of PPE

- Buddy System for Donning and Doffing

- Doffing is highest risk time to health care provider
  - Soiled PPE not removed properly
  - Complacency
  - Needs to be methodical
  - Hand Washing

Donning- Level 2 PPE

- **Donning (putting on) PPE:**
-
- FOOT and LEG COVER
  - slip foot and leg into leg cover and pull the leg covering up until it is in position
- GLOVES (nitrile)
- place on the "inner gloves" and extend to cover the wrist
- GOWN (impervious)
  - fully cover torso, fasten in back of neck
- N95 Respirator
  - put on the N95 respirator as per protocol and fit-check respirator prior to entering the room
- GOGGLES
  - place over face and eyes and adjust to fit
- FLUID RESISTANT HEAD and NECK COVER
  - cross one tie to the left and one tie to the right bringing to back of head, tie in a bow
- FACE SHIELD
  - place over face and eyes and adjust to fit
- GLOVES (nitrile)
  - place on the "outer gloves" and extend to cover wrist of the isolation gown
- * **Double gloves**

Doffing- Level 2 PPE

- GLOVES (nitrile)
  - remove the“ outer gloves” by grasping the outside cuff of one “outer gloved” hand with opposite “outer gloved” hand
  - then peel off “outer glove” only ; hold removed “outer glove” in remaining “outer gloved” hand
  - slide fingers of “inner gloved” hand under remaining “outer gloved hand and wrist
  - peel “outer glove” off over first “outer glove”; discard
- FACE SHIELD
  - handle by headband
- FLUID RESISTANT HEAD and NECK COVER
- unfasten the tie in the back of your neck
- place your hand at the top of your head grasping & pulling the head & neck cover back and away from your head , discard)
- GOWN (impervious)
  - pull away from neck and shoulders, touching inside only, turn gown inside out
  - fold or roll into bundle and discard
- FLUID RESISTANT FOOT and LEG COVER
  - using both hands slip your second & third fingers inside of the foot & leg cover,
  - fold & roll cover down towards ankle & foot (never touch the outside of the foot & leg cover)
  - lift foot up and slide out pulling the foot & leg cover away from your body
- GLOVES (nitrile)
  - “ inner gloves”- grasp outside with opposite gloved hand
  - peel off; hold removed glove in gloved hand
  - slide fingers of ungloved hand under remaining glove at wrist peel glove off over first glove; discard
- HAND HYGIENE use soap & water or hand sanitizer
- GOGGLES and N95 RESPIRATOR
- remove the goggles: handle the head strap and remove
- without touching the respirator, slowly lift the bottom strap from around your neck up over your head; lift off the top strap and discard
- HAND HYGIENE use soap & water or hand sanitizer
- **Note: The outside is contaminated!** *Place ALL items in Red Bag Waste*

Donning- Level 3 PPE

- **Donning (putting on) PPE:**
-
- PROTECTIVE SUIT
  - While seated place suit on
  - Only place the suit to the waist
- FOOT and LEG COVER
  - slip foot and leg into leg cover and pull the leg covering up until it is in position
  - Tape the leg covers to the protective suit (50% on the suite and 50% on the leg cover)
- GLOVES (nitrile)
- place on the "inner gloves" and extend to cover the wrist
- PROTECTIVE SUIT
  - Now cover the upper body part
- GLOVES (nitrile)
  - place the outer gloves on.
  - pull over suits wrists and secure with chemical tape
  - Now, zip the suit, close the storm flap, and secure the flap (50% on the on suite and 50% on the flap)
- PAPR (Power aired purified respirator) unit on waist
  - place on waist and turn on
  - fold and wrap extra waist band and insert into the side of the waist band that's around the waist.
- PAPR HOOD with cover
  - place over head and adjust to fit
- * **Double gloves**

Doffing- Level 3

- **Doffing (removing) PPE:**
-
- Body splashes in the room can be wipe away from you with EPA approved disinfectant
- Decontaminate the protective suit EPA-approved disinfectant, when possible
- PAPR Unit
  - PAPR unit and batteries is held by 1st assistant(in level 2 PPE)
  - Remove the battery pack and motor
  - Always hold the PAPR unit and batteries away from you
- GLOVES (nitrile) – 1st pair "outer glove"
  - remove chemical tape from wrist, center and leg of the suit
  - then, remove the" outer gloves" and discard the gloves
- PROTECTIVE SUIT
  - roll suit off starting at shoulders and rolling the suit into itself, only touching the outside of the suit.
  - roll suit past the knees
- FLUID RESISTANT FOOT and LEG COVER
  - the assistant should assist in removal of foot and leg cover,
  - fold and roll cover down towards ankle and foot (never touch the outside of the foot & leg cover)
  - lift foot up and slide out pulling the foot & leg cover away from your body
  - repeat with other leg and foot
- PROTECTIVE SUIT by the assistant
- a) take off rest of suit
- b) remove the suit from the person
- GLOVES (nitrile)
  - " inner gloves"- grasp outside with opposite gloved hand
  - peel off; hold removed glove in gloved hand
  - slide fingers of ungloved hand under remaining glove at wrist peel glove off over first glove; discard
- PAPR HOOD
  - tilt head slightly backward, reach under hood, lift off and hand to assistant
  - step away from the dirty area
- HAND HYGIENE use soap & water or hand sanitizer
- A shower should be taken following removal of the PPEs.
- **Note: The outside is contaminated!** *Place ALL items in Red Bag Waste*

- http://link.videoplatform.limelight.com/media/?mediaId=63390f2e4305416b994807313190cdb4&width=480&height=321&playerForm=Player

Special Circumstances

- Pediatrics
- Pregnant Patients
- Interfacility Transfers- Level 3 PPE

Tracking

- Create Tracking/Log Sheet of all crew contacts
- Document activity
- Tracking Sheet will be utilized by Employee Health Services/DOH for surveillance purposes

Tracking Form Sample

Center for Emergency Medical Services
EVD Universal Tracking Form

Incident Location: _____

CAD Incident Number: _____ Page: _____ of _____

ID	Name (Last, First)	Conact Phone Number	Pos.[1]	E.L.[2]	Approx Time Exposed (Min)	Pre PPE Donning Vitals				Post PPE Doffing Vitals			
						BP	Pulse	RR	SAO2	BP	Pulse	RR	SAO2
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1 - Position (Pos.) Key: (PC) Patient Care, (IC) Incident Command, (OP) Other Public Safety Offical, (FF) Family/Friends, (BS) Bystander, (LS) Logistics/Support, (PT) Patient, (DD) Doffing / Decontamination

2 - Exposure Level (E.L.) Key: (U) Unprotected contact, (L2) PPE Level 2 Contact, (L3) PPE Level 3 Contact (Note first arriving EMS crew may have more than 1 exposure code)

Post Call

- PATIENCE!!!
- Decontamination- Based upon DOH risk assessment
  - Ambulance- Contract Vender?
  - Equipment/Stretcher
  - Self
- Surveillance

Surveillance

- If source patient is positive
  - Lab TAT- Currently about 12 hours
- 21 day Medical Monitoring (Active vs Passive)
  - Twice Daily Temps/Sign and Symptoms
  - Daily telephone Contact with Injury Management Team
  - Furlough decision based on IP/EHS evaluation of the exposure risk
  - Have a home plan (no formal recommendations to date-use common sense)

EVD Surveillance Log

Ebola Virus Disease (EVD) Exposure Medical Surveillance Signs/Symptoms Log

Name: _____

Date of last exposure: _____

Day:	DAY 1		DAY 2		DAY 3		DAY 4		DAY 5		DAY 6		DAY 7	
Date:														
Time of check:	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Signs/Symptoms														
Fever: subjective or ≥ 100.4°F														
Headache														
Joint or muscle aches														
Weakness														
Diarrhea														
Vomiting														
Stomach pain														
Lack of appetite														

System Employees

- Travel to and/or through countries that have been identified by the CDC as having widespread transmission of Ebola (Sierra Leone, Liberia, and Guinea), within 21 days prior to reporting to work must report their travel history to EHS.
- EHS will make a determination to: 1) return to work without further requirements; 2) commence self-monitoring for signs and symptoms of Ebola; 3) participate in a mandatory EHS EVD medical surveillance program, and/or 4) take administrative leave

CDC EMS Checklist

- Prepare to Detect
  - Train in signs and symptoms
  - Train to ask about fever/travel- Triage Screening
  - Designate representatives as points of contact with DOH
  - PI Component to ensure compliance

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CDC EMS Checklist

- Prepare to Protect
  - Inventory PPE Supplies
  - Ensure PPE meets standards of NIOSH, OSHA, and FDA
  - Train in PPE/Partner with Community resources
  - Use of buddy system
  - PI Component of PPE Compliance
  - Review and update environmental and cleaning procedures
  - Ensure notification process with Emergency Department

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New York State Requirements

- Education for PPE
- Hands on training for PPE- Credentialing
- Ongoing reassessment
- 2 Champions per department
- Protocol for medical waste disposal
- Protocol to clean/disinfect vehicles and equipment
- Maintaining logs for all suspect patient contacts

Challenges

- Proper identification of patients
  - Not all fever and travel is created equal
  - Patient reliability
- Obtaining equipment
- Staff concerns about safety
- Training
- On going training and competencies
- Complacency

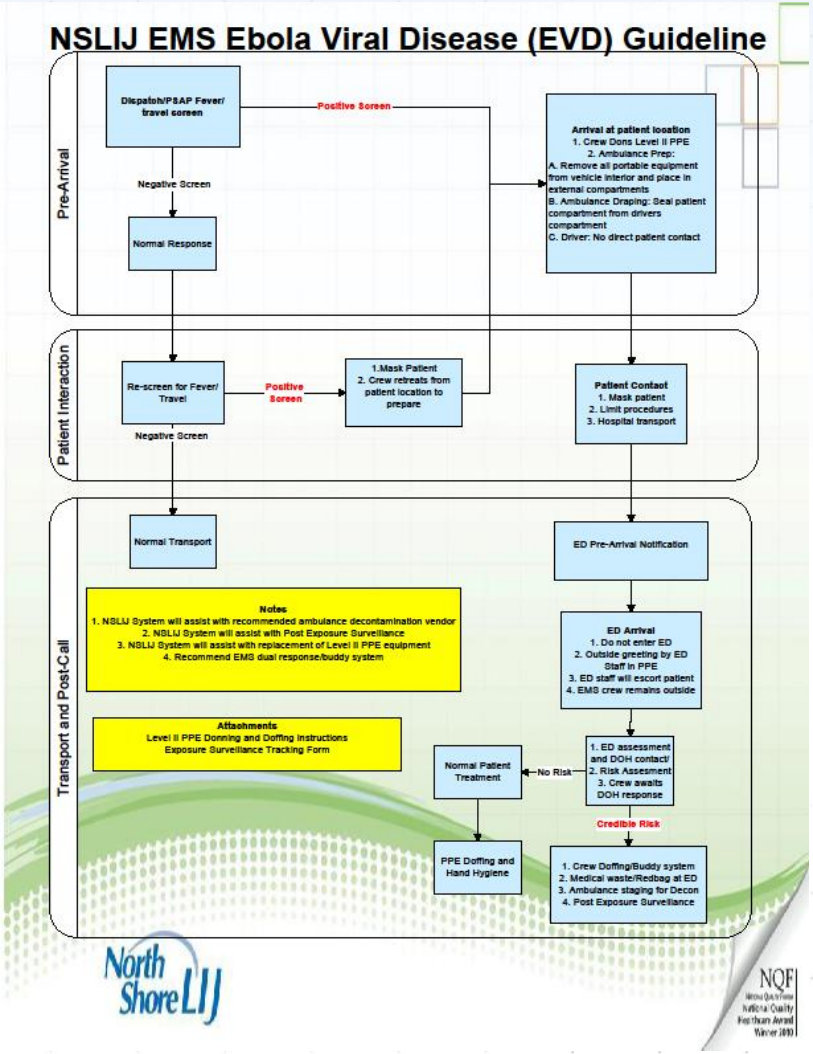
Oh, By the Way!!!!

- Influenza Season is Starting
  - Similar symptoms- Ask about travel
  - Hand hygiene
  - Droplet precautions
  - Get Vaccinated

Take Home Points

- Recognition- Ebola is not endemic to Peru, Ukraine, and Spain
- Deliberate and Methodical Donning and Doffing- There is NO rush!!
- Pre Arrival Notification and Don’t Enter Emergency Departments on Arrival
- Post Exposure Surveillance of Confirmed Cases

EMS Decision Tree Tool Kit



Thank You

- Questions
- Comments
- Concerns

- MGuttenberg@NSHS.EDU

Thank You

- North Shore University Hospital
- North Shore Health System- Center for Emergency Medical Services
- North Shore Health System- Emergency Medicine Service Line