Preparing for Ebola
(or whatever is coming next):
Perspectives from the Region IX Ebola Treatment Center

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Overview

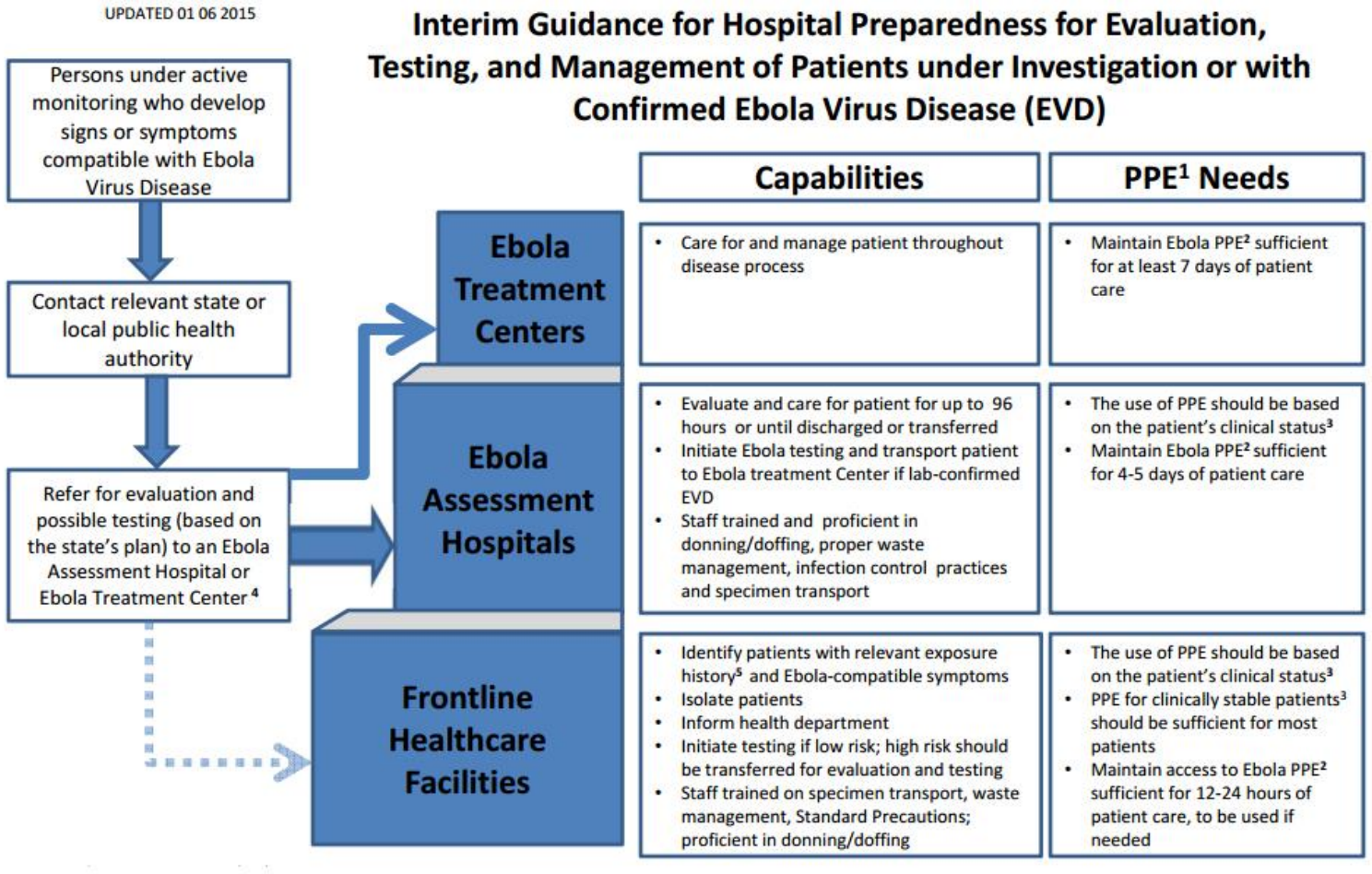
- **Part One: About Cedars-Sinai**
  - Who we are
  - Responsibilities as a Regional Ebola Treatment Center
- **Part Two: About our Preparations**
  - Organizational Structure and Treatment areas
  - Laboratory and Waste Capacity
  - Team, Training, and Drills
  - Communications
- **Part Three: About Next Steps**

Part One: About Us

Cedars-Sinai

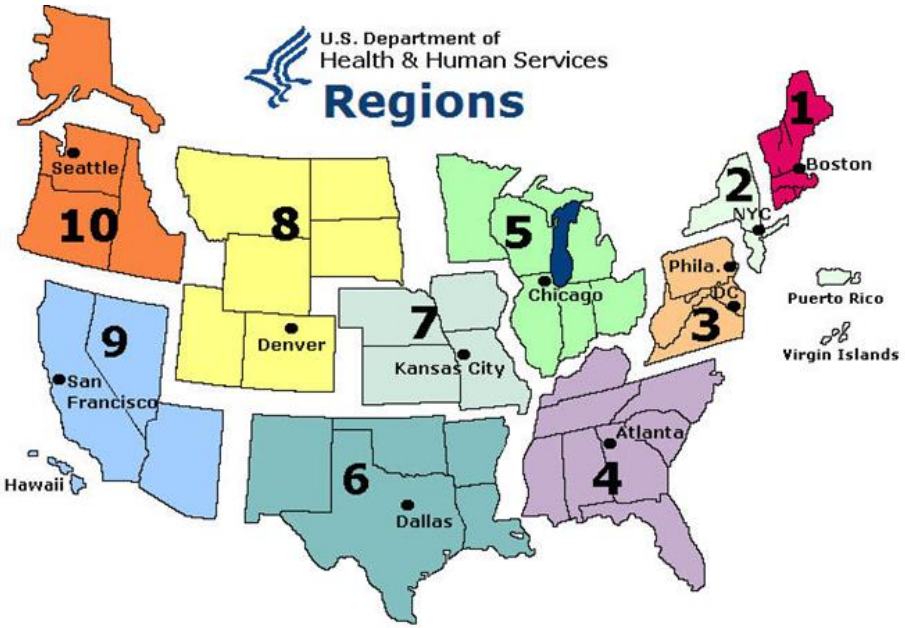
- 886-bed tertiary care, academic, community not-for-profit medical center in Los Angeles
- >49,000 admissions and 630,000 outpatient visits per year
- More than 10,200 full-time employees
  - 2,100 physicians on medical staff
  - 400 faculty
- >500 residents and fellows in graduate medical programs, with fellowships in 80 specialties and subspecialties
- Ranks among the nation's top independent hospitals in National Institutes of Health (NIH) funding
- Magnet Excellence in Nursing designation four consecutive times by the American Nurses Credentialing Center

CDC Tiered Approach



https://www.cdc.gov/vhf/ebola/healthcare-us/preparing/hospitals.html

Regional Special Pathogens Center: Key Responsibilities



- Be prepared to receive a patient within 8 hours of notification
- Capacity to care for 2 simultaneous patients (including 1 child)
- Maintain a trained response team
- Maintain adequate supplies of personal protective equipment (PPE)
- Capacity to handle a high volume of infectious waste
- Annual NETEC onsite assessment

National Collaboration:
National Ebola Training & Education Center (NETEC)

- Members from all 10 regional treatment centers
- Networking, collaboration, and sharing of best practices (regular meetings, points of contact)
- National resource for training and education
- Advocacy & Research
  - e.g. Experimental therapeutics (Zmapp)

Learning from Others

Hospital Preparedness

- **Nursing**
- **Physicians (Critical care, ID, pediatrics)**
- **Infection Prevention**
- **Environmental Safety**
- **Emergency Department**
- **ICU Staff**
- **Disaster Management**
- **Communications**
- **Laboratory**
- **Imaging**
- **Employee Health**
- **Behavioral health/Crisis Management**
- **Bioethics**
- **Respiratory therapists**
- **Environmental Services**
- **Security**
- **Human Resources**
- **EIS**
- **Others**…

Domains of Preparedness

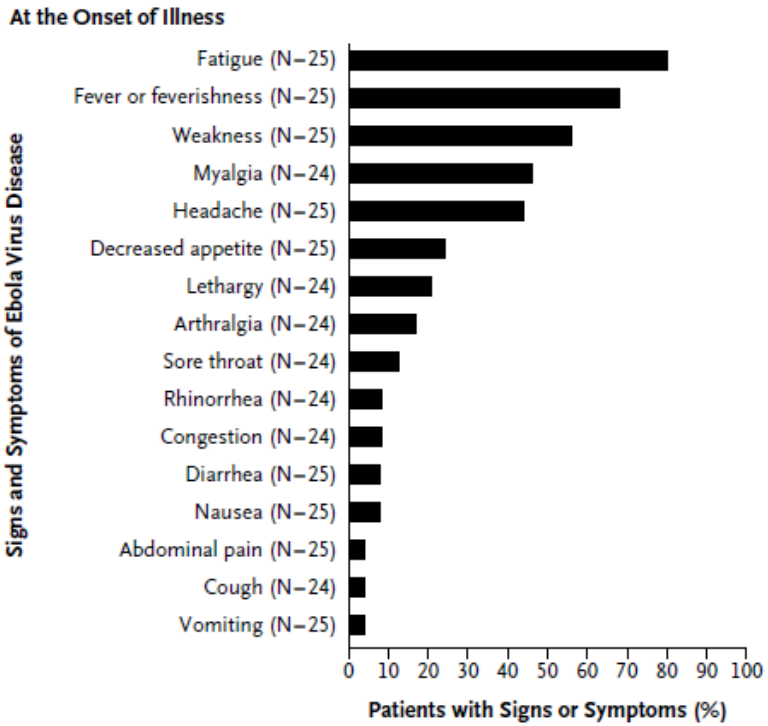
1. Pre-Hospital, EMS, ED
2. Staffing of patient care teams
3. Patient transport
4. Patient Placement
5. PPE Donning/Doffing
6. HCW Monitoring and exposures
7. Lab safety and capacity
8. Environmental Infection Control and Equipment reprocessing
9. Waste Management
10. Communications
11. Management of Deceased
12. Special Populations

ORIGINAL ARTICLE

Clinical Management of Ebola Virus Disease in the United States and Europe

- Review of all patients who received care for Ebola in US/Europe
- 27 patients; median age 36
- Median hospitalization 20d (survivors)
- 85% received investigation therapy
- Mortality 18.5%

- Take Away for Ebola Treatment Centers:
  - Long hospitalization
  - Be prepared to use investigational agents
  - High quality care can improve outcomes



Uyeki TM et al, NEJM 2016; 374: 636-46

Part Two: About Our Preparations

Preparing for the ***next*** threat, not the last threat

Cedars-Sinai Special Pathogens Program

- Special Pathogens Program Coordinator
- Special Pathogens Clinical Education Coordinator

- SPRT Task Force
  - Safety/Disaster Management, Epidemiology, Nursing Resources, Critical Care MDs, Communications, Human Resources, Simulation Center, Laboratory, Crisis Management, EVS, Pediatrics, ED, Patient Safety, EHS

- SPRT Volunteer Clinical Response Team
  - Nurses, physicians (critical care, ID, pediatrics, OB), respiratory therapy, EVS
  - Quarterly training
  - Quarterly drills

US Ebola Cases

- Cases diagnosed in US (2014)
  - Sep 30 – died (Dallas)
  - Oct 10 – survived (NIH)
  - Oct 15 – survived (Emory)
  - Oct 23 – survived (Bellevue)

- Cases transferred to US for treatment (2014)
  - Aug 2 - survived (Emory)
  - Aug 2 – survived (Emory)
  - Sep 5 – survived (Nebraska)
  - Sep 9 – survived (Emory)
  - Oct 6 – survived (Nebraska)
  - Nov 15 – died (Nebraska)

CS Ebola Organizational Response

Early Detection

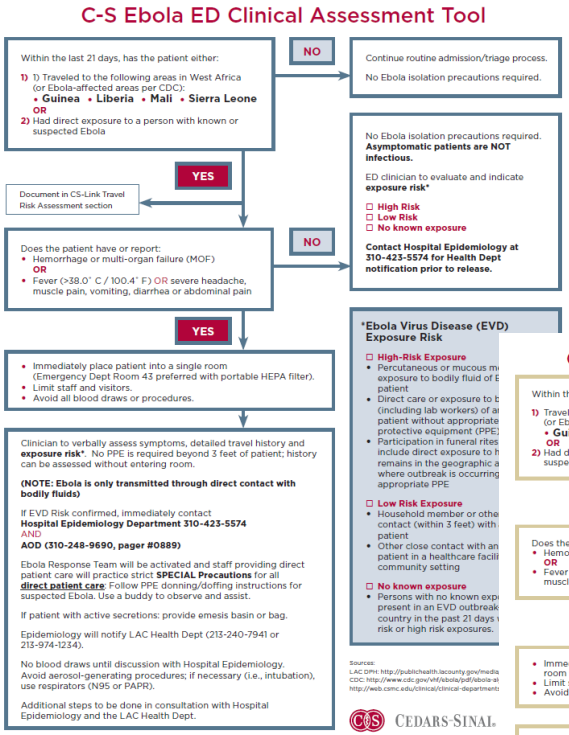
IF you have recently traveled out of the U.S.

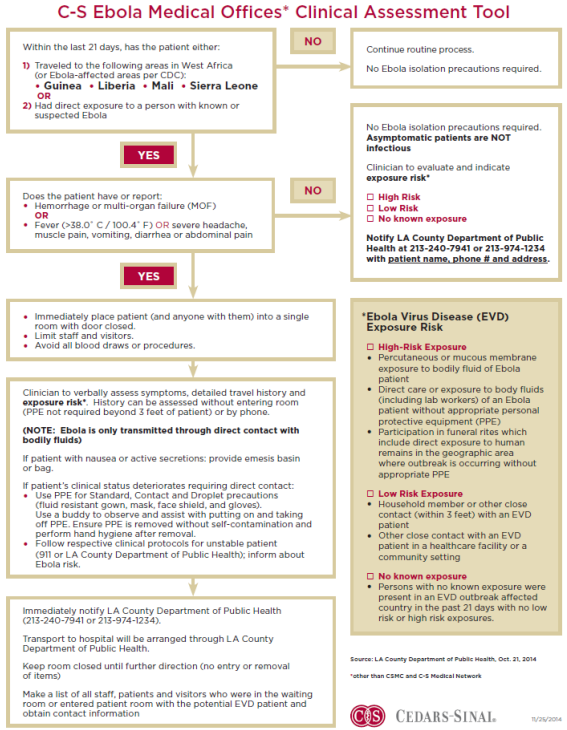
OR had close contact with someone who recently traveled out of the U.S. and is ill...

AND now you have: fever, cough, trouble breathing, rash, vomiting or diarrhea

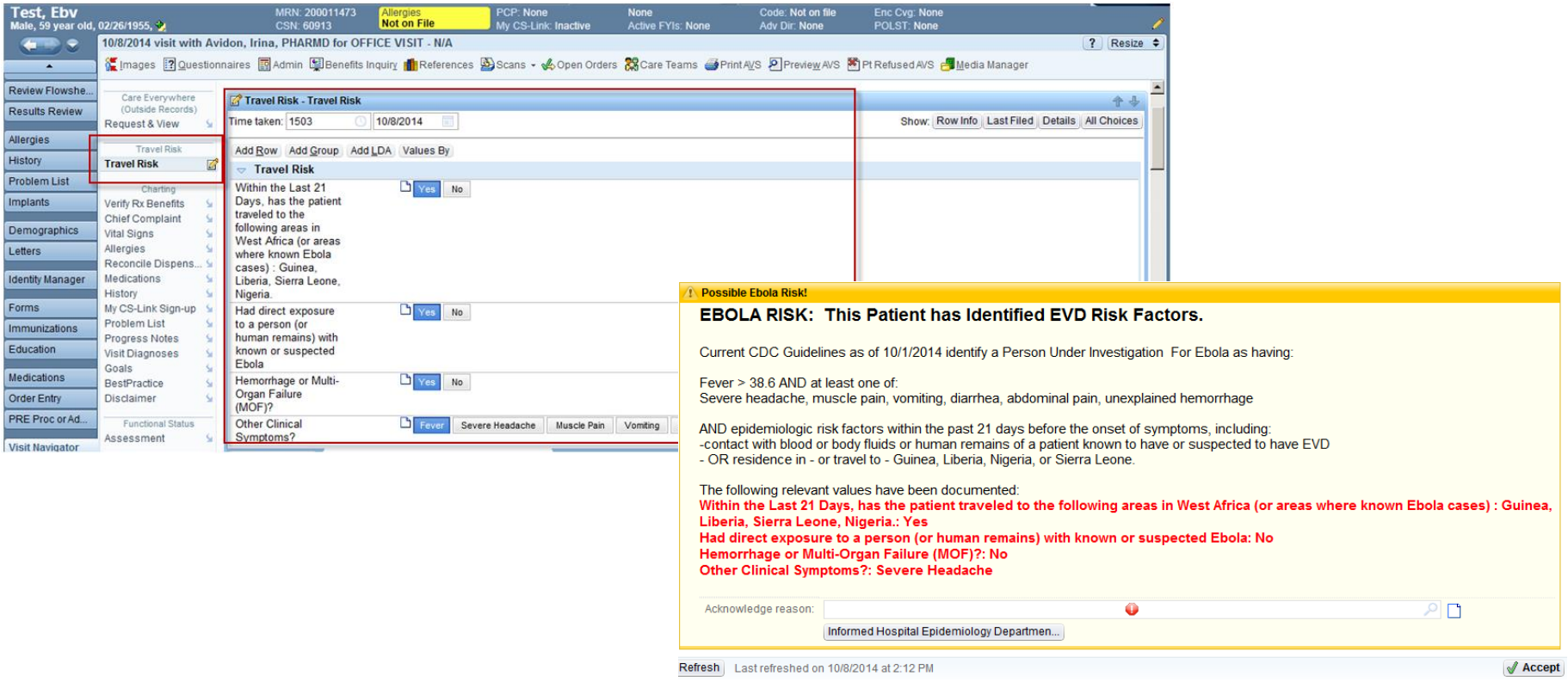
PLEASE TELL STAFF IMMEDIATELY

CEDARS-SINAI





CS Link (Epic) Screening Tool



Answering yes to either of the first two questions AND either of the second two questions will trigger Best Practice Alert

Hospital Activation Plan

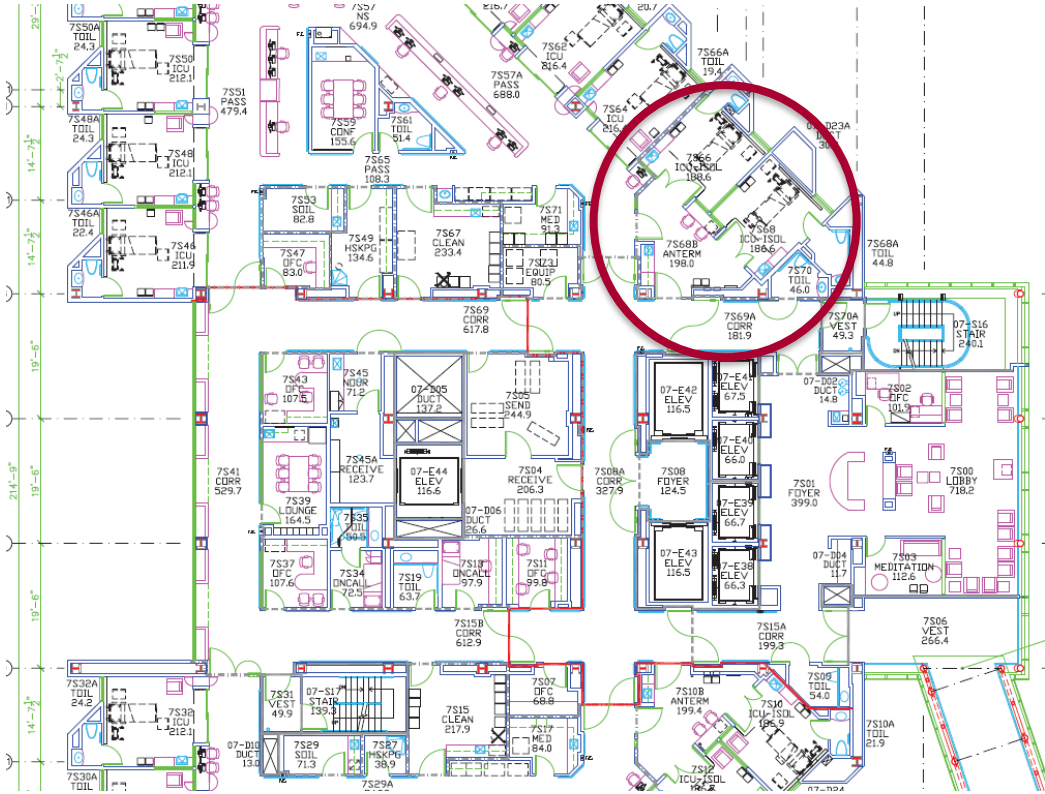
- Electronic notification to leadership and clinical response team
  - –Text, phone calls, emails (repeat until answered)
- Open Hospital Command Center
- Prepare treatment unit
- Conduct just-in-time PPE training for response team

Treatment Areas

- Ambulance bay to accept EMS ground transport
  - Secured, private bay
  - Separate from ED ambulance bay
  - Direct and controlled access to medical ICU
- Emergency Department
  - Dedicated ED room
  - Direct and controlled access to medical ICU
- Medical ICU
  - Negative pressure isolation
  - Large anteroom
  - Secured access

Patient Care Area: Medical ICU

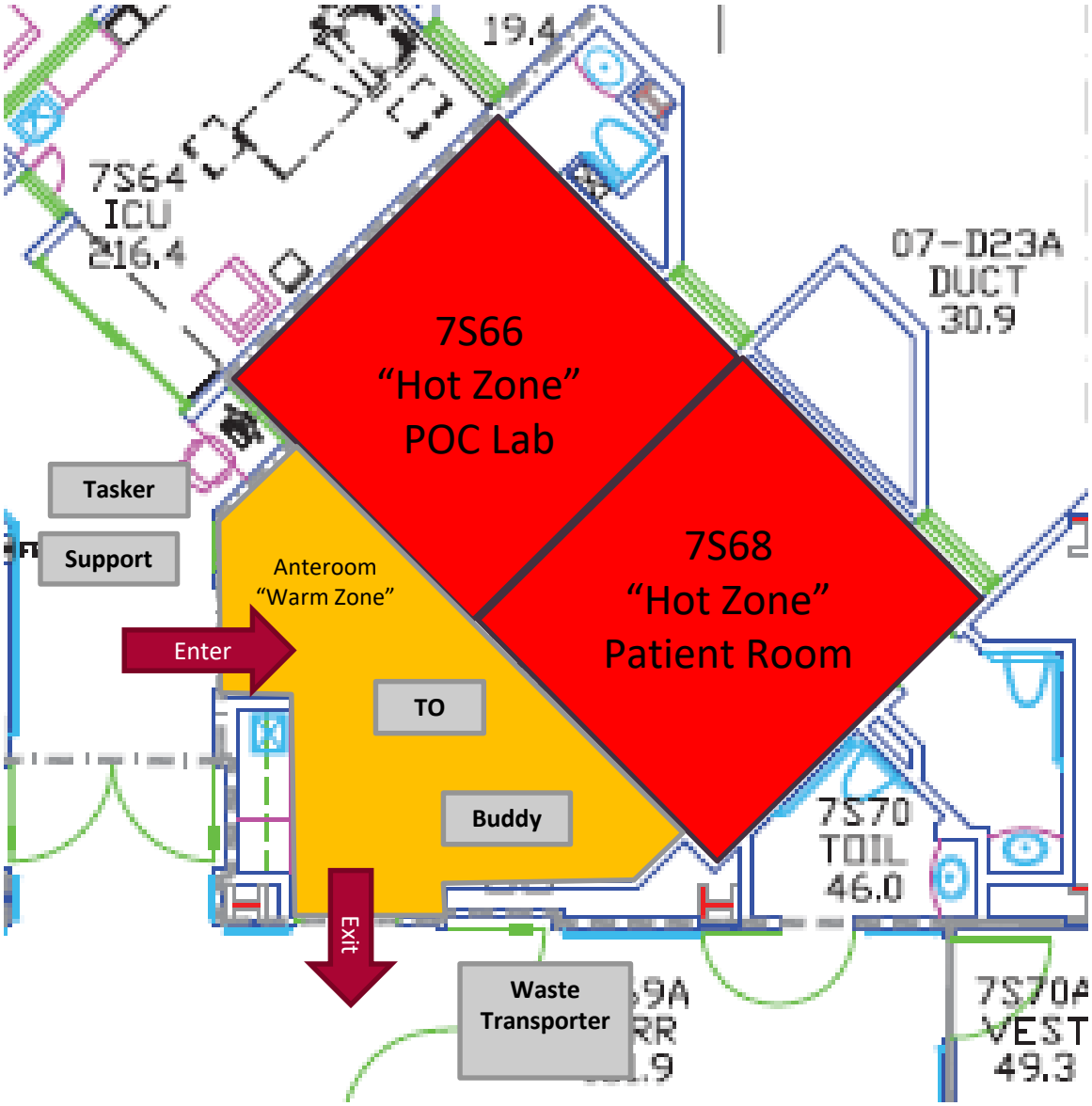
- Negative pressure room with bathroom and large anteroom and
- Patient care room
- POC lab (neighboring room)
- No patient transport outside room
- Designated areas for
  - Donning PPE
  - Doffing PPE
  - Safety monitor
  - Staff shower
  - PAPR Reprocessing



Medical ICU

HCW Roles:

-Bedside HCW
-"Buddy" HCW
-Trained observer
-Safety Monitor
-Tasker
-Support staff
-Waste transporter
-Lab technician
-Lab "buddy"



Patient Care Room

POC Laboratory (Neighboring Patient Room)

- Class 2 Biosafety cabinet setup in adjacent room
- Lab techs will work in pairs (both in full PPE)
- Specimen handoff protocols
- Category A Specimen packaging
- No labs performed in main laboratory

Point-of-Care Lab Capabilities

Instrument	Tests	
Piccolo Express **Chemistries** **Comprehensive Metabolic Panel**	ALB ALP ALT AST BUN Ca CRE Cl K	eGFR* GLU TBIL TP NA PHOS tCO2 Mg
Alere BionaxNOW **Malaria Detection**	Malarial Screen Sensitivity 99.7% Detects all 4 Vivax sp.	Differentiates falciparum form others
Sysmex pocH-100i Hematology Analyzer **Hematology**	WBC RBC HGB HCT MCV PLT	
Urinalysis Dipstick	Glucose Bilirubin Ketone Specific Gravity Blood	pH Protein Urobilinogen Nitrite Leukocyte Esterase
Hemochron Signature Elite	Citrated Protime with INR	Citrated APTT
Veritor	Rapid ID of Influenza A and B	

Waste Management

- Waste Streams
  - EMS/Ambulance waste
  - ED
  - Treatment area (ICU)
- Liquid waste
  - Pretreatment with disinfectant prior to flush
  - Protocol approved by LA City Sanitation
  - Toilet, sink, dialysate
- Solid waste
  - EVS transport plan and dedicated pathway
  - Two large-capacity onsite autoclaves
  - Contracted third party waste transport vendor (backup)

2.1 Waste Transportation Inc. Soiled Linen/Sharps - Daily

Start Process

Purell

Start Donning Process Put on a Coverall

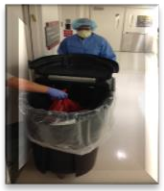
Put on a N95 Mask

Wear safety Goggles

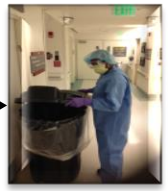
Put on head cover and gloves

Fully Donned

Report with Gondola to pick up point



Open lid to receive deposit



Close lid after deposit

Sanitize Exterior with Clorox Wipes

Transport via designated route

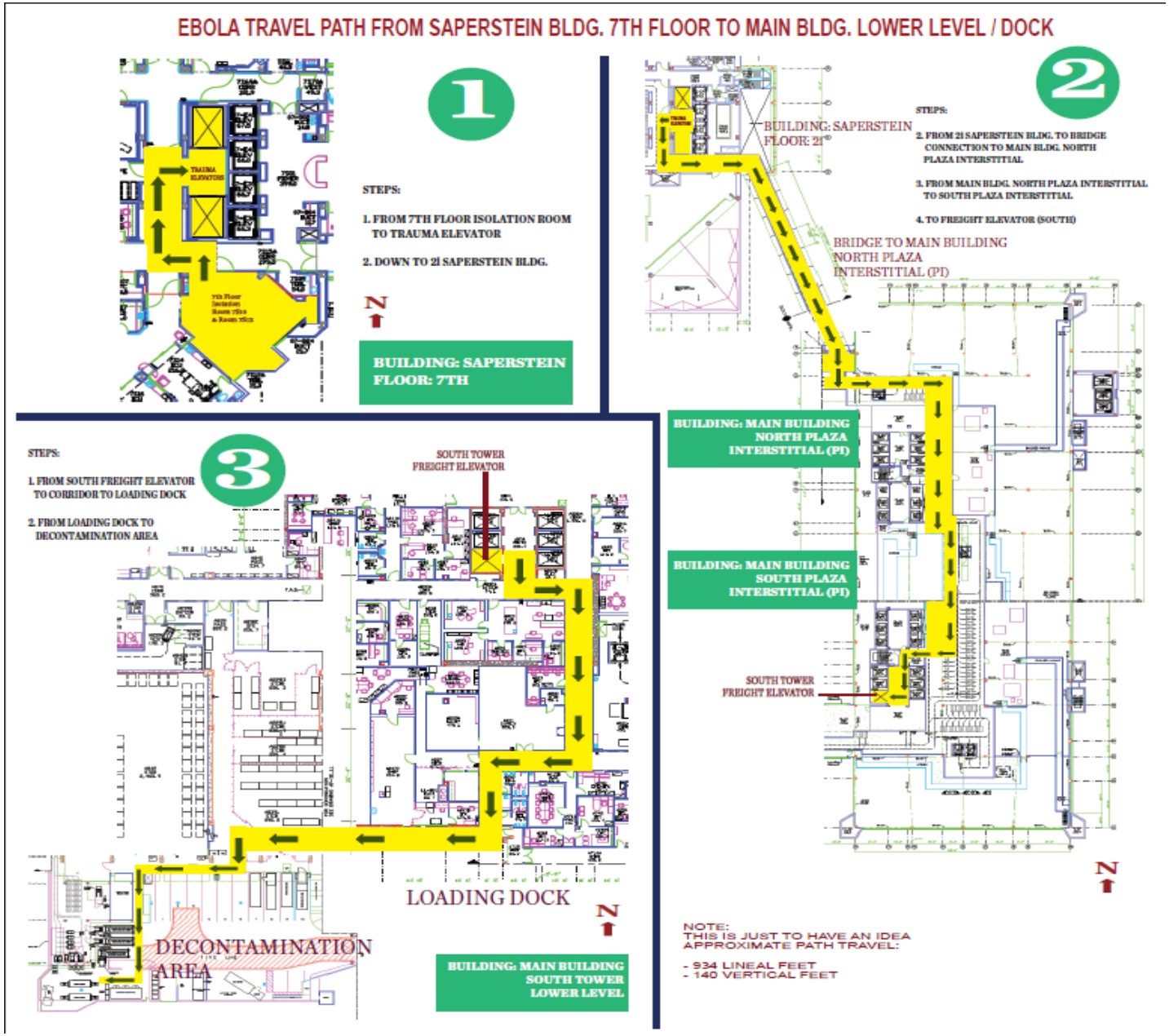
SCCT 2i through Pi to South Twr

So Twr Freight Elevator

Destination: Hand off to AGVS Staff

Repeat Process

2.4 Transportation of Waste; Map Path (7SCCT-Dock)



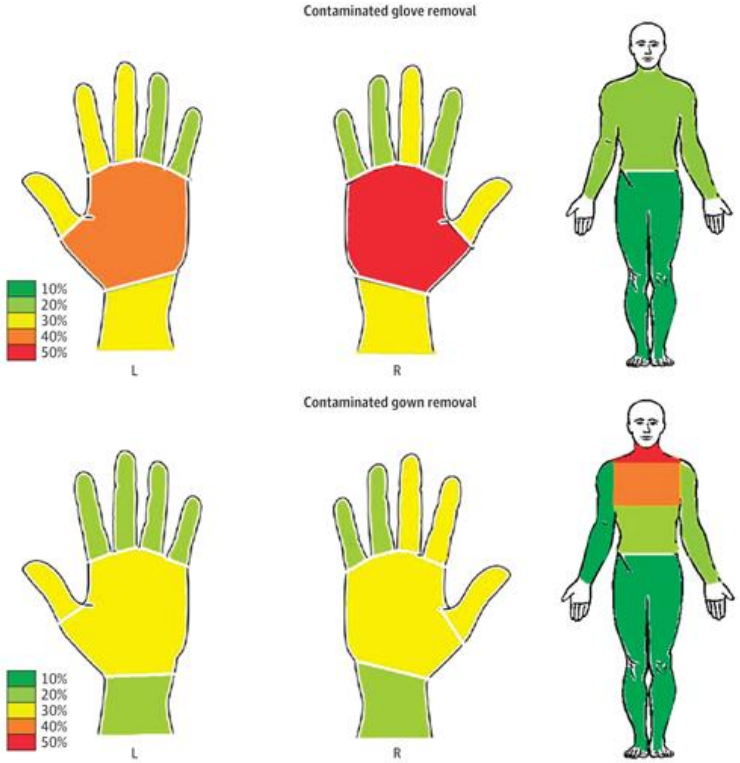
Special Pathogens Response Team

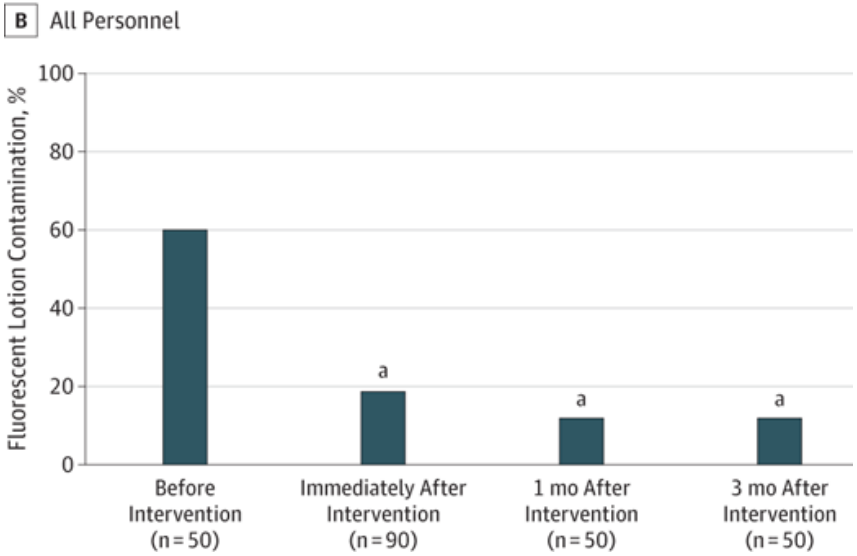
- Membership is voluntary
- Willing and able to work in full PPE for up to 4 consecutive hours
- Able to work in teams and accept constructive feedback
- Commit to participate in training and drills
  - Initial training session (once)
  - Ongoing training (quarterly)
  - Must participate in one drill/year
- Team members by role:
  - Nurses (ED, ICU, Med/Surg, Pediatric ICU/NICU)
  - Physicians (critical care, ID, Pediatrics, Obstetrics)
  - Respiratory therapists
  - Clinical Lab Scientists
  - Environmental Service Supervisors

Special Pathogen Response Team: Principles for Staffing Model

- Staffing scenarios developed for 1 or 2 patients
  - 1 patient → 5:1 RN to patient ratio
  - 2 patients → 8:1 RN patient ratio
- Staff rotate roles every 4 hours
  - Bedside RN, doffing assistant, trained observer, tasker, support staff
- Safety monitor always present
- 12 hour shifts; no more than 4 consecutive hours in full PPE
- No more than 3-4 shifts/week
- Pediatric RN always at bedside for pediatric patient
- CS to provide all clothes under PPE (disposable scrubs, shoes)
- Employee Assistance Program and HR involved in task force

Doffing PPE: A Risk Factor





- Regular training in PPE donning/doffing is essential
- Always use a doffing partner and trained observer
- Never rush

Tomas ME et al, JAMA Int Med 2015; 175: 1904-10

SPRT Training Plan

- **Initial Training (4 hours):**
  - Region 9 Treatment Center responsibilities
  - Infection Control practices
  - Roles and responsibilities of team members
  - Introduction to PPE
  - Patient transport and handoff
  - Post-exposure monitoring

- **Refresher Training (~2 hours):**
  - Briefing on selected protocols or relevant topics
  - Don PPE
  - Practice a skill selected by the instructor
  - Practice a skill selected by participants
  - Doff PPE

- **Bi-Annual Skills Fair**

Training

- Clinical Simulation Lab
- Practice clinical skills in full PPE
  - –IV placement
  - –Central line placement
  - –Intubation
  - –Spill management
- Fluorescent dye markers provide direct HCW feedback

Drills

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Ebola Drill Addresses Challenges of a Teen Patient

Kat Green, RN, (right) and Grace Teaman, RN, tend to teen volunteer Bryce Caufield during a preparedness drill for treating patients with highly infectious diseases like Ebola.

Cedars-Sinai recently staged an Ebola drill with a twist: A teen volunteer played the patient and another volunteer played his mom.

The Special Pathogen Response Team runs the drills periodically to practice treating patients with highly infectious diseases. This group of healthcare providers has rehearsed with pretend adult patients, but never with a teen.

"We're continuing to expand the different types of scenarios we may encounter, including working with family members of somebody with these types of infections to make sure we're supporting them," said Jonathan Grein, MD, medical director of the Department of Hospital Epidemiology and infection

- Performed quarterly
- Invaluable tool to identify weaknesses (and creative solutions)
  - –Also a recruitment strategy
- Often involve external partners
  - –EMS
  - –Local health department
- Debrief and After-Action report
- Mistakes are ok (as long as we continually improve)

Drill Photos: EMS Participation

Drill Photos: Patient Transport

Drills

Central line placement

Use of Telemedicine Equipment

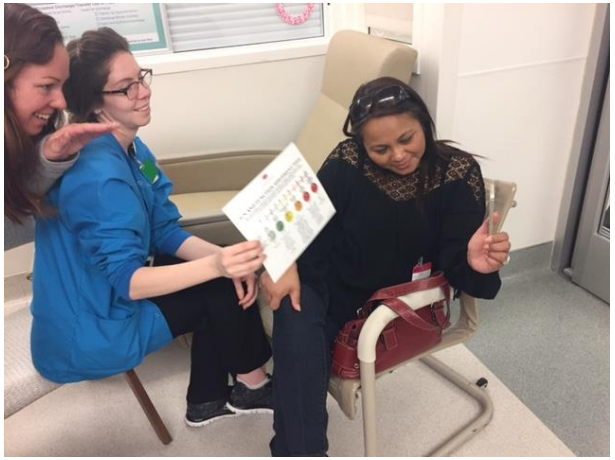
Remote AV Communication capabilities

- Digital stethoscope
- Portable ultrasound
- HIPAA compliant

Drills: Examples of Lessons Learned

"Life is trying things to see if they work." – Ray Bradbury

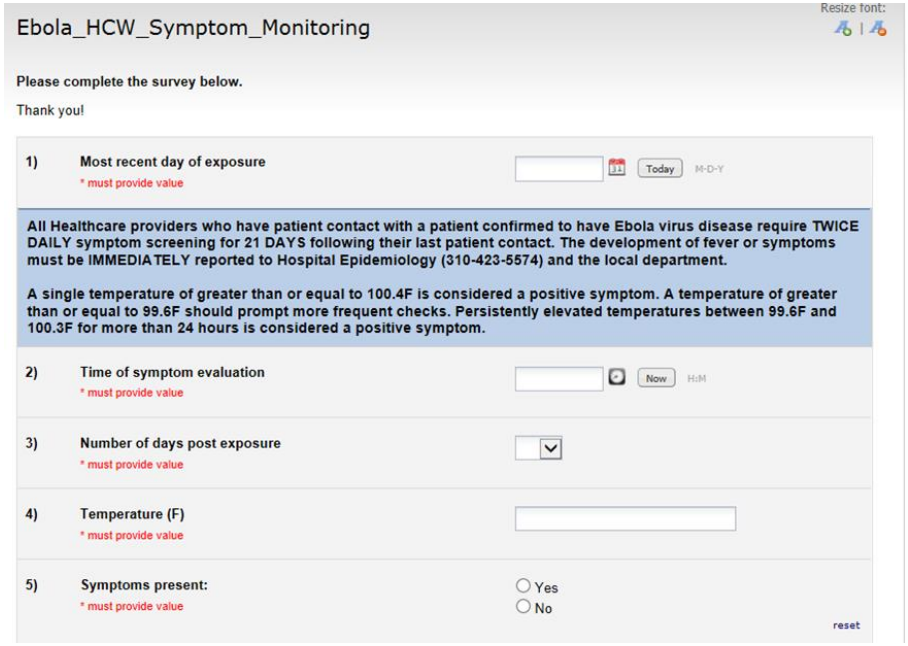
- Value of including external partners (EMS, public health lab)
- Importance of team work and communication
  - Write HCW roles on PPE
  - Educate to explicit roles and responsibilities
- Early and regular family communication
  - Identify family point-of-contact, engage Social Work
- Importance of involving security
- Smaller drills just as useful as full-scale drills
- Don't be afraid to try new things (try different locations, manage unexpected events in real time, be flexible)



What the Special Pathogens Response Team is about…

- Commitment to provide safe and high-quality care to **patients who need it the most**
- Protecting our staff
- Multi-disciplinary teamwork
- Problem-solving solutions to unique challenges

Electronic Healthcare Worker Symptom Monitoring



Resize font:

Ebola_HCW_Symptom_Monitoring

Please complete the survey below.

Thank you!

1) **Most recent day of exposure**
* must provide value
Today M-D-Y

All Healthcare providers who have patient contact with a patient confirmed to have Ebola virus disease require TWICE DAILY symptom screening for 21 DAYS following their last patient contact. The development of fever or symptoms must be IMMEDIATELY reported to Hospital Epidemiology (310-423-5574) and the local department.

A single temperature of greater than or equal to 100.4F is considered a positive symptom. A temperature of greater than or equal to 99.6F should prompt more frequent checks. Persistently elevated temperatures between 99.6F and 100.3F for more than 24 hours is considered a positive symptom.

2) **Time of symptom evaluation**
* must provide value
Now H:M

3) **Number of days post exposure**
* must provide value

4) **Temperature (F)**
* must provide value

5) **Symptoms present:**
* must provide value
Yes
No

reset

Record_ID	Demographics Day 1 (AM)	Symptoms Day 1 (AM)	Symptoms Day 2 (AM)	Symptoms Day 2 (PM)	Symptoms Day 3 (AM)	Symptoms Day 3 (PM)	Symptoms Day 4 (AM)
1	●	✓					
2	●	✓					
3	●	✓	✓				
4	●	✓	✓				
5	●						
6	●	✓	✓				
7	●	✓	✓				
8	●	✓					
9	✓	✓					
10	●	✓					
11	✓	✓	✓	✓	✓	✓	✓
12	✓	✓	✓	✓	✓	✓	
13	✓	✓	✓	✓			
14	✓	✓	✓				
15	✓	✓					

Special Pathogens Response Team Newsletter

Purpose:
- Team-building
- Informational
- Recruitment

Sections:
- In The News
- Policy and Protocol Updates
- Upcoming Training and Drills
- Welcome New Members
- Training Tidbit
- Recruitment statement

Special Pathogens Response Team Newsletter

Produced by and for the Cedars-Sinai Region IX Special Pathogens Response Team

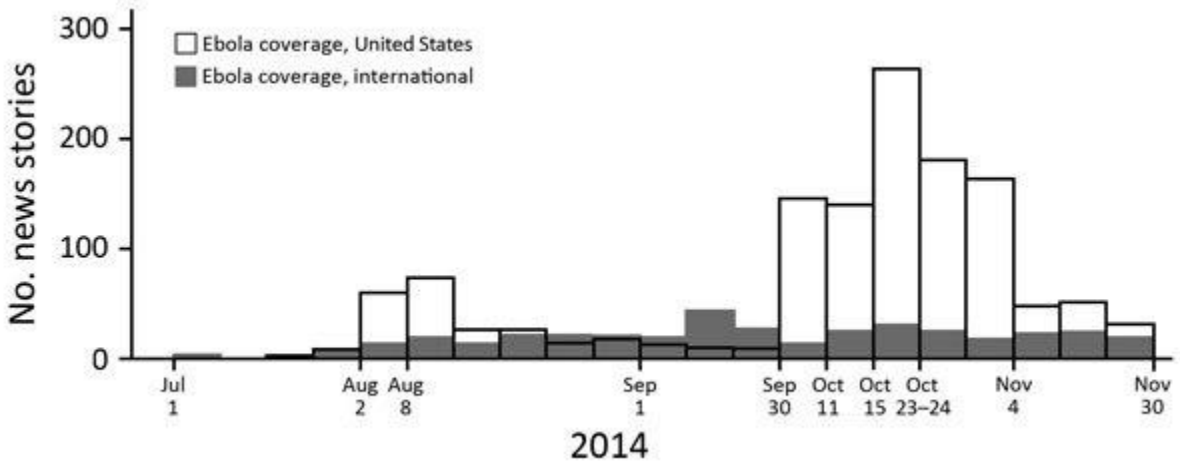
In the News

New MERS outbreak in a Saudi Arabian hospital. Ten people (including two healthcare workers) were diagnosed with Middle Eastern Respiratory Syndrome (MERS) in March 2017, associated with transmission in a hemodialysis unit. No deaths have been reported and two people were asymptomatic. MERS is a coronavirus (related to SARS) and has been associated with several hospital outbreaks in the Middle East and South Korea since it was first described in 2012. http://www.reuters.com/article/us-health-mers-idUSKBN17619K

H7N9 Avian Influenza activity in China. Seventeen new human H7N9 cases have been identified in China in March. Nearly all had direct exposure to poultry. To date, more than 500 human cases have been related to 179 deaths since October 2016. Many authorities are concerned H7N9 has the potential to cause a human pandemic. However, to date, nearly all infections follow direct poultry exposure and sustained human-to-human transmission of H7N9 has not been observed. http://www.cidrap.umn.edu/news-perspective/2017/03/china-reports-17-h7n9-cases-fast-disease-progression-noted

Crimean-Congo Hemorrhagic Fever strikes Oman. Nine cases, including 3 deaths, of CCHF have occurred in Oman. CCHF is a tick-borne viral illness with mortality rates as high as 40 percent. Typically, more than 1,000 cases are described annually in Eastern Europe and Asia, most through tick bites. However, the infection can be spread person-to-person through blood/bodily fluid exposure and healthcare workers have been infected in several hospital outbreaks. http://timesofoman.com/article/105291/Oman/Three-dead-as-Crimean-Congo-Fever-spikes-in-Oman

Role of Communications



- US news coverage peaked after first US case (Aug 2014)
- 96% of coverage contained >=1 risk elevating message
- Despite increased coverage, public had misunderstandings about transmission
  - *i.e., 48% believed transmission could occur before symptom onset*
- Only 32% of news coverage included scientific knowledge on transmission

Sell et al, Emerg Infect Dis 2017; 23: 108-11

Communications

- Communications plays an essential role in Special Pathogen readiness

- Internal Communication Plan
  - –Drills are highlighted in regular employee communications
  - –In the event of activation, templates developed for:
    - Staff information and FAQs
    - Patient/Visitor handouts

- External Communication Plan
  - – Invite external media to drill events
  - –Templates developed in the event of activation

Cedars-Sinai Home | MS Exchange Log On | Feedback | Share Your News

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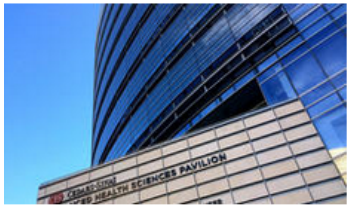
Ebola Drill Tests Cedars-Sinai's Readiness

Caring for the "patient" during the Ebola drill were Heather Jones, MD, medical director of the Critical C Intensivist Service, (left) and Eileen Dulce, BSN, RN, CCRN. Playing the patient was Gregory Eichelz MSN, RN, CEN, clinical nurse IV educator.



Los Angeles Times

L.A. NOW JUNE 14, 2016

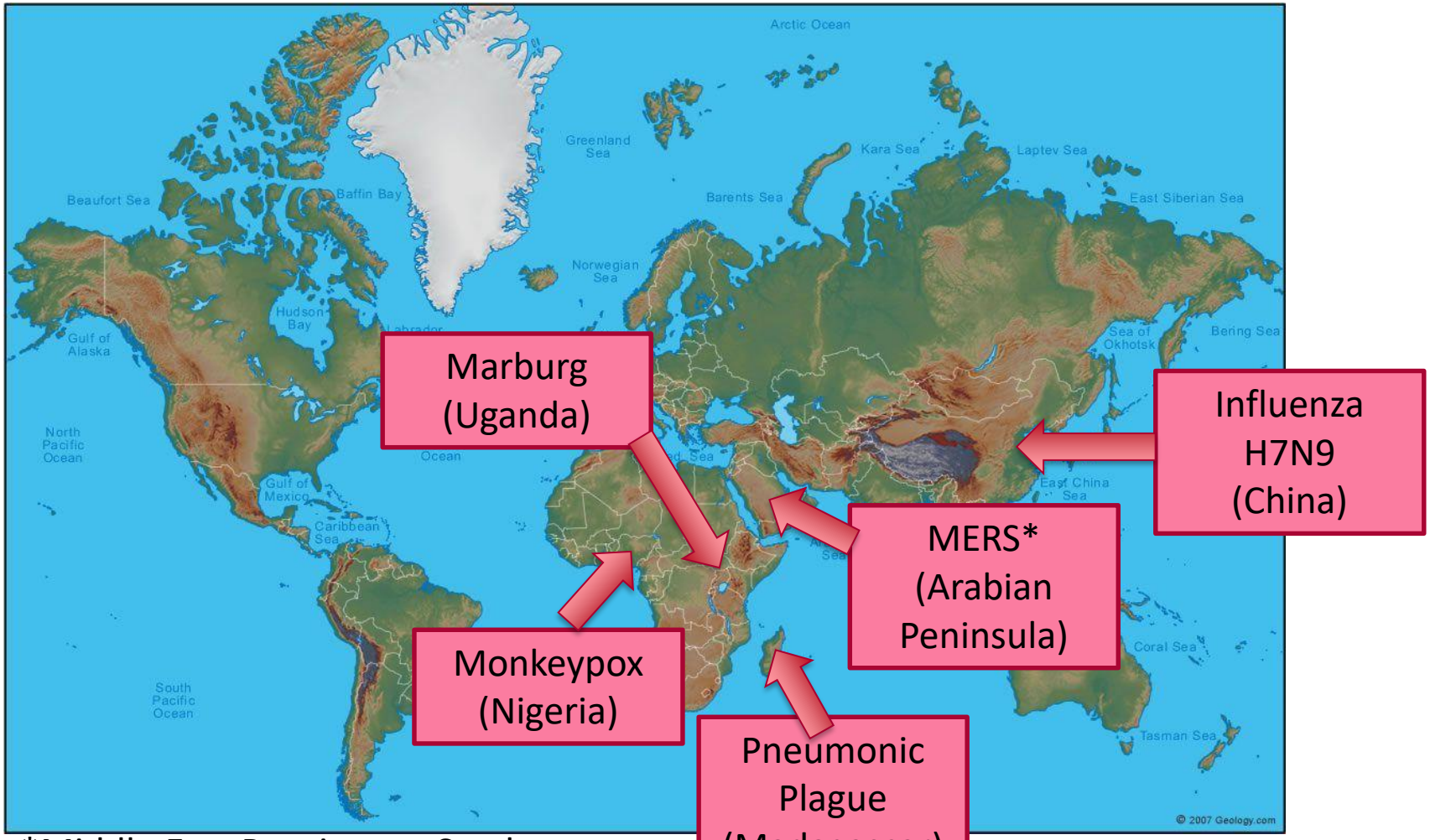
Cedars-Sinai Medical Center tapped to fight Ebola

By Soumya Karlamangla

The 2014 Ebola outbreak killed thousands of people worldwide and set off international panic about the spread of the highly contagious disease. In the U.S., it also exposed concerns about how prepared the health system is to fight infectious diseases. As part of an effort to improve the nation's...

Part Three: About the Future

Situation Report – Highly Communicable Diseases



*Middle East Respiratory Syndrome

Emerging Respiratory Illness Preparation

- Engage Emergency Department in MERS readiness
- Identify, Isolate, Inform
- Regular unannounced "walk-in" drills for triage staff
- Emphasize the importance of a recent travel history in patients presenting with acute febrile illness
- Challenge is teaching more to principles, less to specific pathogens

CSMC Emergency Department MERS Clinical Assessment Tool

Does the patient have:
- Fever

AND/OR
- Respiratory symptoms – cough, SOB, dyspnea, sore throat, rhinitis

NO → Continue routine admission/triage process. No MERS isolation precautions required.

YES

Within the last 14 days, has the pt:
- Traveled to countries on or near the Arabian Peninsula?
- Had close contact with a person who has recently traveled to countries on or near the Arabian Peninsula and is now ill?
- Had contact with a known MERS patient?

NO → Continue routine admission/triage process. No MERS isolation precautions required.

Countries in and around the Arabian Peninsula:
Bahrain • Iraq • Iran • Israel • the West Bank and Gaza Jordan • Kuwait • Lebanon • Oman • Qatar • Syria Saudi Arabia • the United Arab Emirates (UAE) • Yemen

YES

- Immediately place facemask on the pt and move to room 21

if room 21 is occupied, consider the following until it becomes available: (a) if pt already in triage room, provide mask, pt to remain in triage with HEPA filter, (b) provide mask and direct pt outside until room is available (c) single room with HEPA filter and door closed

- Place pt on **Contact (gown and gloves) and Airborne (N-95 and faceshield or PAPR)**
- **Notify ED physician and clinical lead regarding MERS risk**
- Start log sheet for all persons entering the pt room (should include activity performed and PPE worn)

Clinician to assess symptoms, detailed travel history, and **exposure risk (see reverse)**

If MERS Risk confirmed, immediately contact
Hospital Epidemiology Department 310-423-5574

All staff entering the patient room will practice strict **Contact (gown and gloves) and Airborne (N-95 and face shield or PAPR) precautions**

Follow PPE donning/doffing instructions. **Always perform hand hygiene after doffing.** Order for doffing is: remove gloves, face shield, and gown in the pt room. Remove N-95 outside the room

For aerosol-generating procedures (i.e., intubation), use PAPRs

Epidemiology to notify LAC Health Dept (213-240-7941 or 213-974-1234)

Management of family and visitors:
- Persons accompanying the pt should apply a facemask and be assessed for symptoms
- Once MERS risk is confirmed and visitor is assessed as asymptomatic, visitors shall remain outside the pt room
- Asymptomatic visitors, families, and close contacts may be evaluated on a case by case basis as determined by Los Angeles County Department of Public Health

Sources:

https://www.cdc.gov/coronavirus/mers/index.html

http://web.csmc.edu/clinical/clinical-departments/epidemiology/isolation-precautions.aspx

6/1/17

Regional Full Scale Exercise

- "Tranquil Terminus" across four DHHS regions (April 2018)
- Air transport to LAX → Ground transport to Cedars-Sinai
- Activation Plan and just-in-time training
- Activate IRB and Investigational drug preparation

//aviationweek.com/site-files/aviationweek.com/files/uploads/2015/12/MedEvac_11_Ebola_PhoenixAir.jpg

Integrating Lessons Learned into Everyday Care

Our long-term vision:

- Leverage Special Pathogens Response Team members to serve as unit resource
- Reinforce basic principles of infection prevention
- Maintain awareness of emerging infectious disease threats

Benefits of Serving as the Region IX Treatment Center

- Developing a team of experts to safely handle the next emerging threat
- Providing service to the community
- Strengthening relationships with local and regional agencies
- Serving as a regional resource
- Contributing to national preparedness efforts

Special Pathogens Regional Symposium

One-day CME-sponsored Regional Symposium hosted at Cedars-Sinai April 30

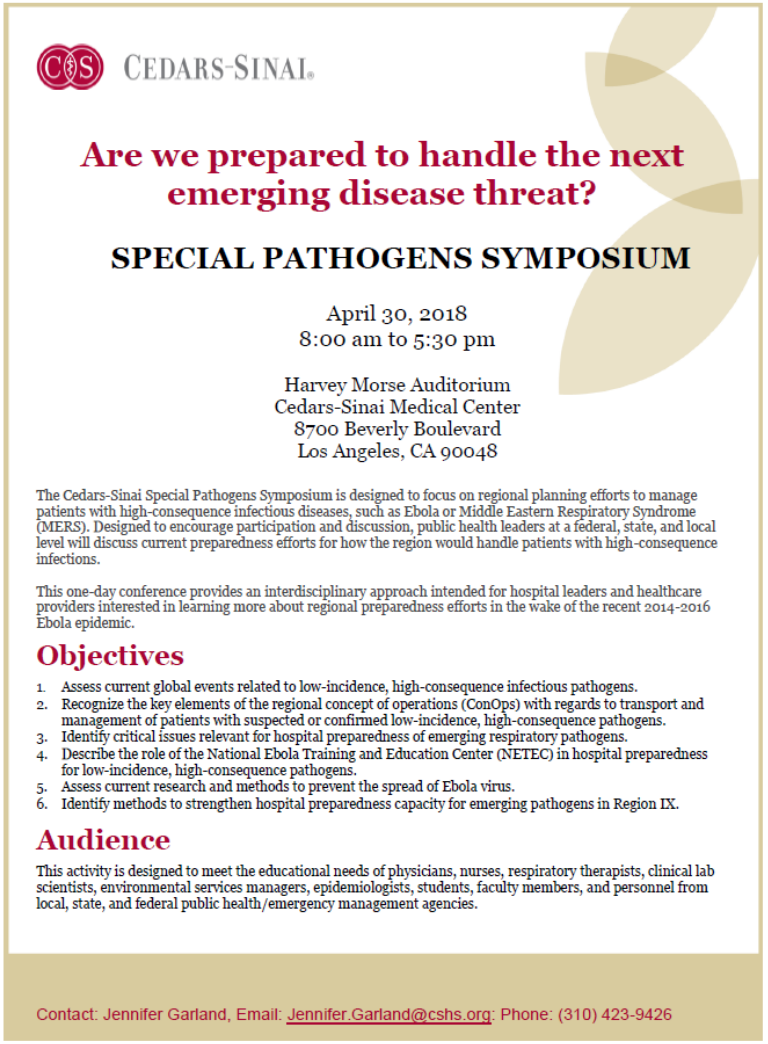
Focus on regional planning efforts to manage patients with high-consequence infectious diseases

Featured speakers include

Jill Morgan, a critical care nurse with expertise caring for Ebola patients at Emory University Medical Center

Dr. Ian Crozier, a clinician scientist with direct experience with Ebola as a clinician, researcher, and patient

Dr. Anne Rimoin, internationally recognized for her work on global emerging pathogens, such as Ebola and monkeypox.



CEDARS-SINAI

Are we prepared to handle the next emerging disease threat?

SPECIAL PATHOGENS SYMPOSIUM

April 30, 2018
8:00 am to 5:30 pm

Harvey Morse Auditorium
Cedars-Sinai Medical Center
8700 Beverly Boulevard
Los Angeles, CA 90048

The Cedars-Sinai Special Pathogens Symposium is designed to focus on regional planning efforts to manage patients with high-consequence infectious diseases, such as Ebola or Middle Eastern Respiratory Syndrome (MERS). Designed to encourage participation and discussion, public health leaders at a federal, state, and local level will discuss current preparedness efforts for how the region would handle patients with high-consequence infections.

This one-day conference provides an interdisciplinary approach intended for hospital leaders and healthcare providers interested in learning more about regional preparedness efforts in the wake of the recent 2014-2016 Ebola epidemic.

Objectives

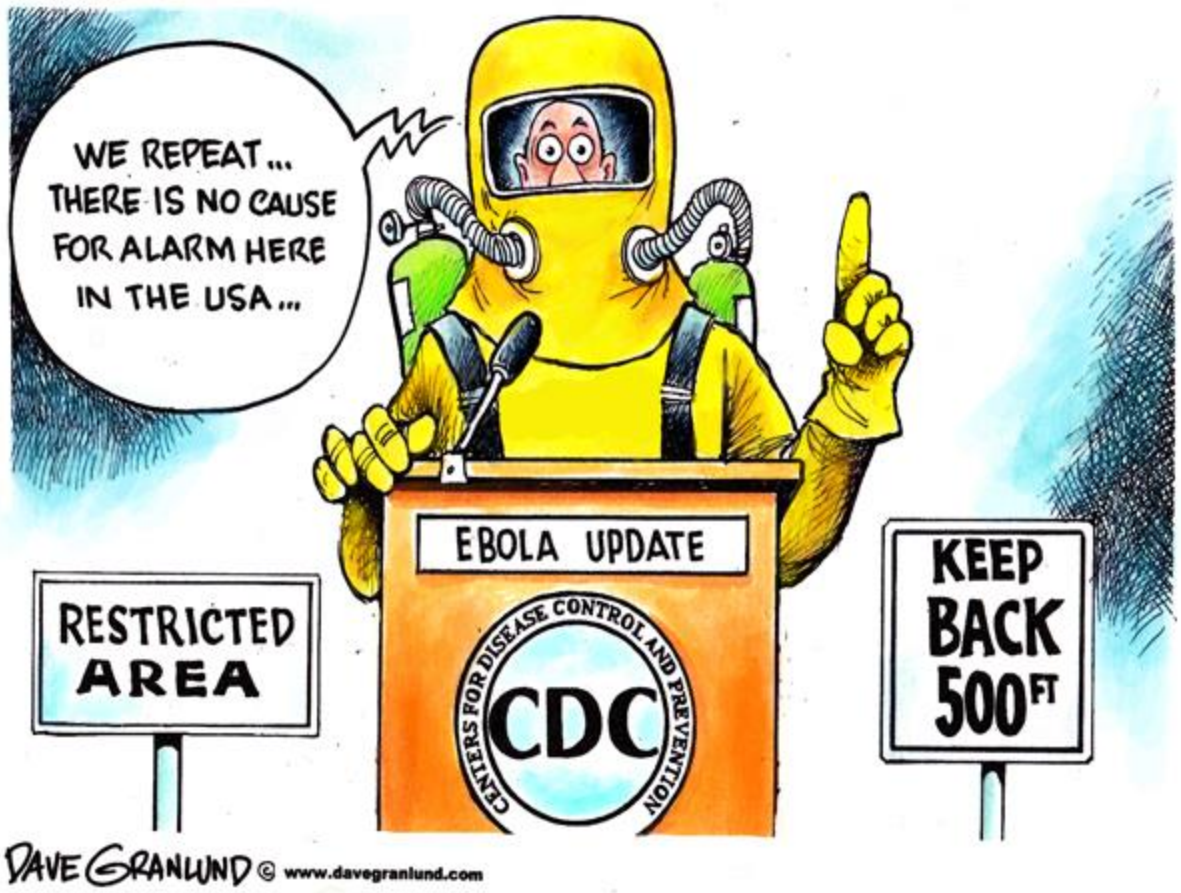
1. Assess current global events related to low-incidence, high-consequence infectious pathogens.
2. Recognize the key elements of the regional concept of operations (ConOps) with regards to transport and management of patients with suspected or confirmed low-incidence, high-consequence pathogens.
3. Identify critical issues relevant for hospital preparedness of emerging respiratory pathogens.
4. Describe the role of the National Ebola Training and Education Center (NETEC) in hospital preparedness for low-incidence, high-consequence pathogens.
5. Assess current research and methods to prevent the spread of Ebola virus.
6. Identify methods to strengthen hospital preparedness capacity for emerging pathogens in Region IX.

Audience

This activity is designed to meet the educational needs of physicians, nurses, respiratory therapists, clinical lab scientists, environmental services managers, epidemiologists, students, faculty members, and personnel from local, state, and federal public health/emergency management agencies.

Contact: Jennifer Garland, Email: Jennifer.Garland@cshs.org; Phone: (310) 423-9426

Thank you!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