

Ebola at Emory: Keeping the Culture of Safety

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**Serious Communicable
Diseases Unit**



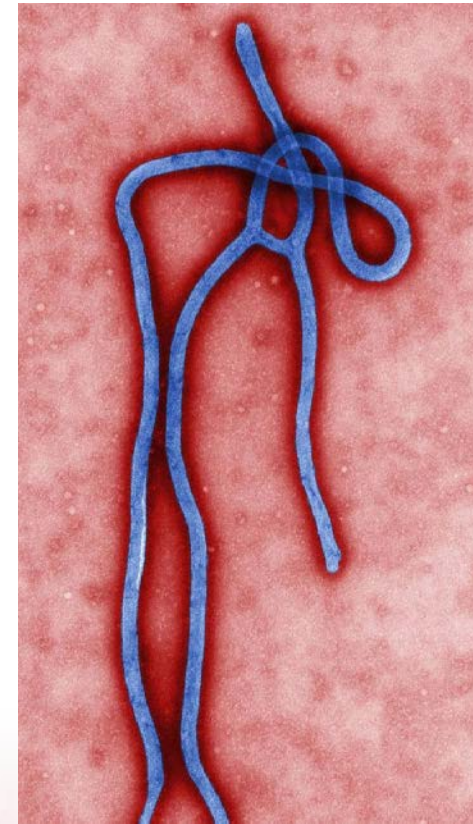
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BACKGROUND

Background on Ebola

- Family Filoviridae
 - Two genera: *marburgvirus* and *ebolavirus*
 - Enveloped, negative, single-stranded RNA viruses
- Five species of Ebola viruses
 - **Ebola (EBOV)**
 - Sudan (SUDV)
 - Tai Forest (TAFV)
 - Bundibugyo (BDBV)
 - Reston (RESTV)
- Transmitted by contaminated body fluids
- Mortality from Ebola virus disease (EVD) historically has ranged from 40-88%



Cynthia Goldsmith/CDC

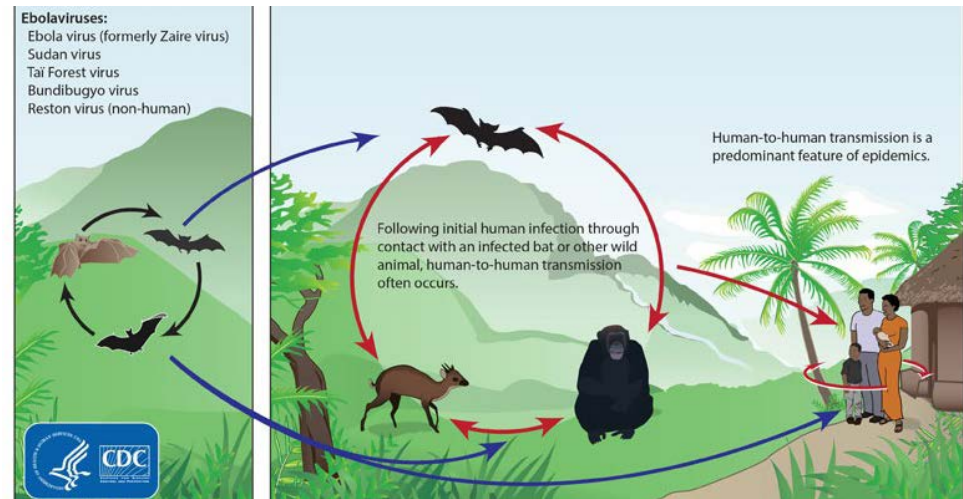


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Ebola Transmission

- Zoonotic infection
 - Natural reservoir = fruit bat
 - Can be transmitted to other mammals
- Spread through direct contact of mucous membranes or broken skin with
 - blood or body fluids
 - Contaminated objects (like needles and other sharps)
 - Infected animals
- Deceased human victims = High amount of viral release after death



Clinical Course of EVD

- Latency of 2-21 days (most 8-10)
- Prodrromal phase – day 1-3
 - Fever, malaise/fatigue, headache, myalgias
 - Leukopenia (esp lymphopenia) & thrombocytopenia
 - Limited viral shedding and negative blood PCR

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Fever	■	■	■	■	■	■	■	■	■	■	■	■		
Myalgias	■	■	■	■	■	■								
Chills	■	■	■	■	■	■	■	■	■					
Headache	■	■	■	■	■	■	■							
Sore throat		■	■	■	■	■	■							
Abdominal pain					■	■	■	■	■	■	■	■		
Diarrhea					■	■	■	■	■	■	■	■		
Vomiting					■	■	■	■	■	■	■	■		
Rash				■	■	■	■	■	■					
Bleeding							■	■	■	■	■	■	■	■
MOF/Death								■	■	■	■	■	■	■

Clinical Course of EVD

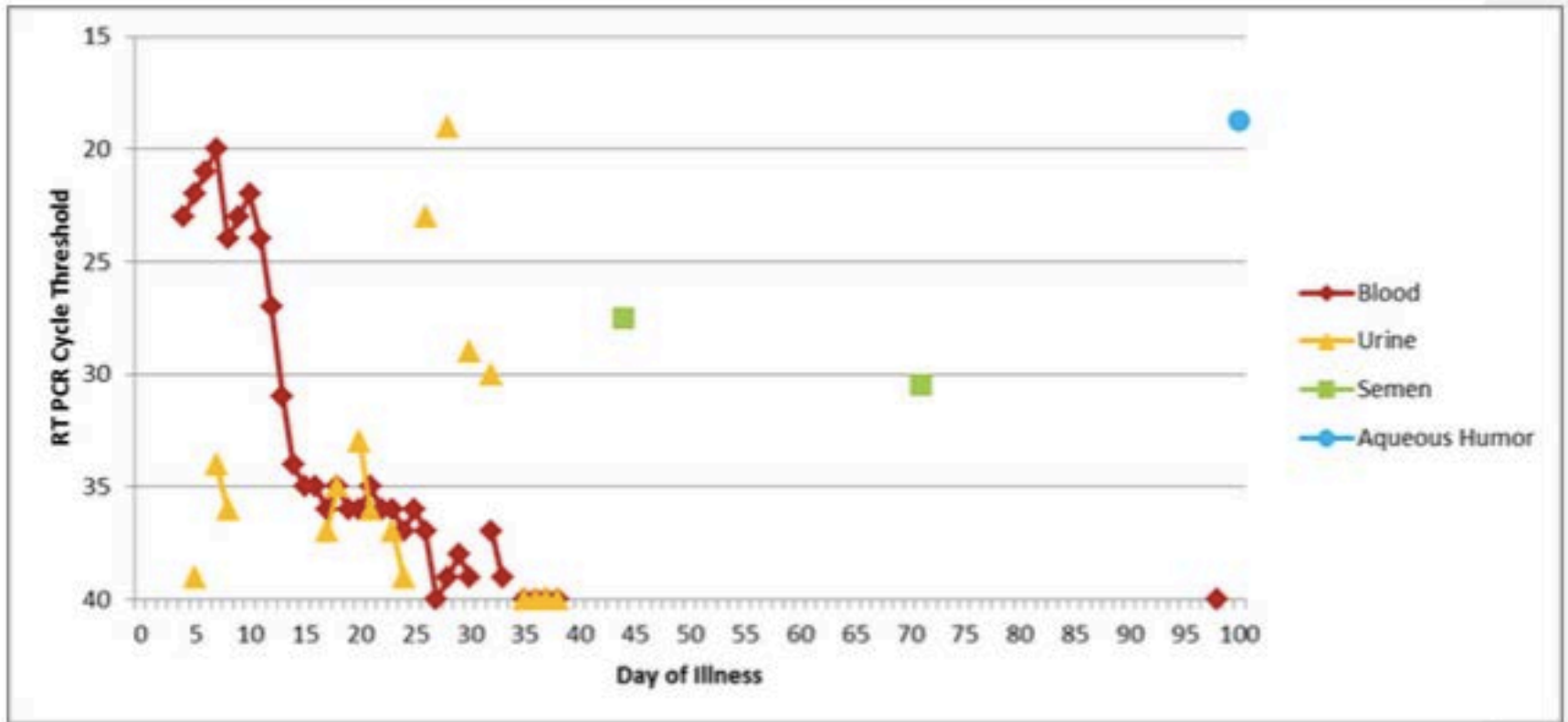
- **Fever + Gastroenteritis/hepatitis – day 3-4 to 8-12**
 - Vomiting, diarrhea → volume depletion, electrolyte loss
 - Metabolic acidosis
 - Elevated AST > ALT but minimal hyperbilirubinemia

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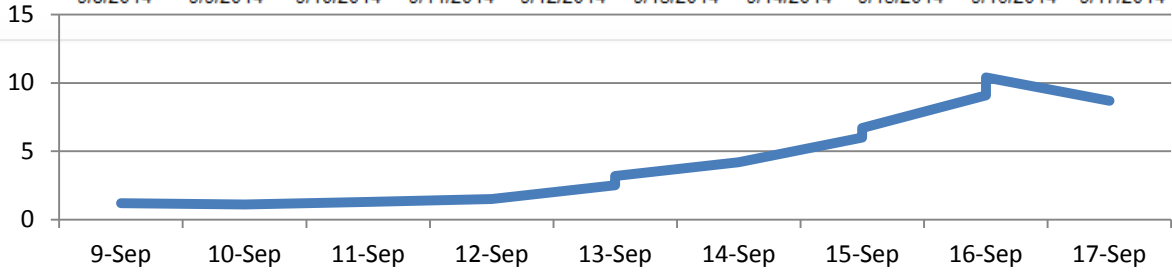
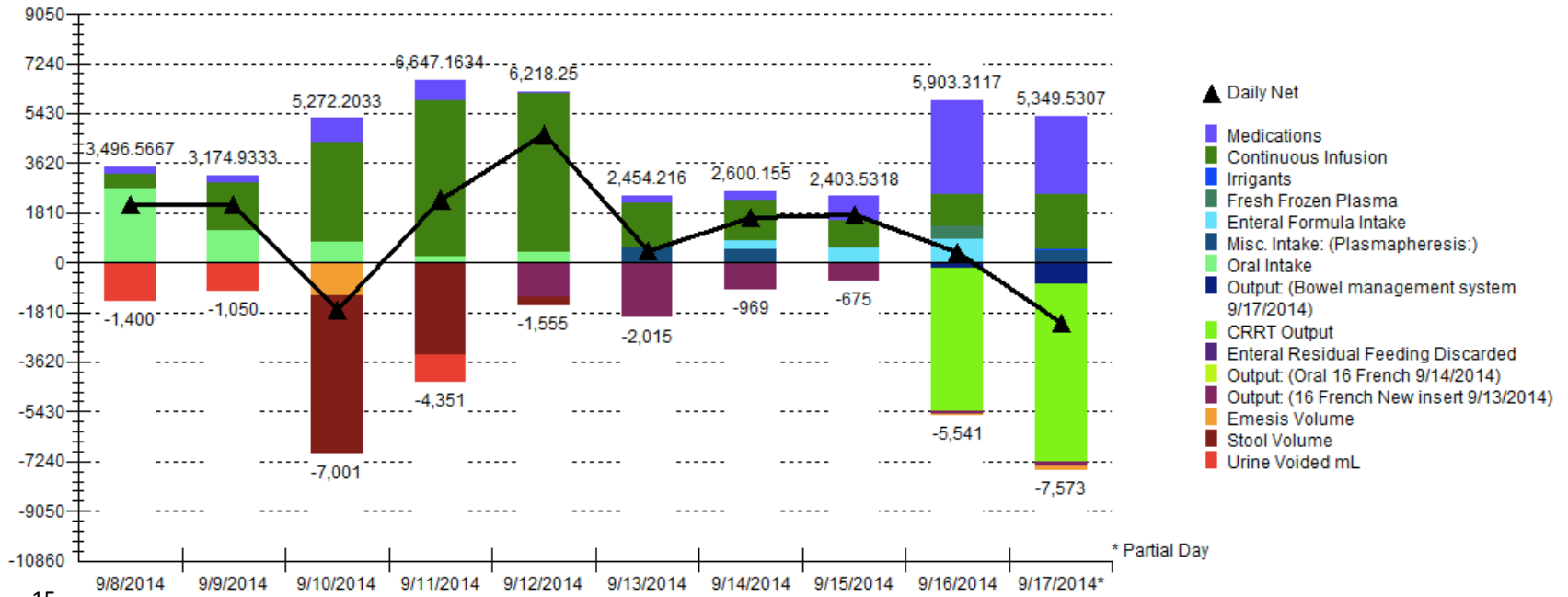
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07 September 2014 18:41 - 18 September 2014 18:41

Intake and Output(mL)



Critical Illness in EVD

- Respiratory distress/failure
- Renal Failure
- Encephalopathy/encephalitis
- Severe Shock
- Severe Hemorrhage

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Fever	■	■	■	■	■	■	■	■	■	■	■	■		
Myalgias	■	■	■	■	■	■								
Chills	■	■	■	■	■	■	■	■	■					
Headache	■	■	■	■	■	■	■							
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Diarrhea					■	■	■	■	■	■	■			
Vomiting					■	■	■	■	■	■	■			
Rash				■	■	■	■	■						
Bleeding							■	■	■	■	■	■	■	■
MOF/Death							■	■	■	■	■	■	■	■

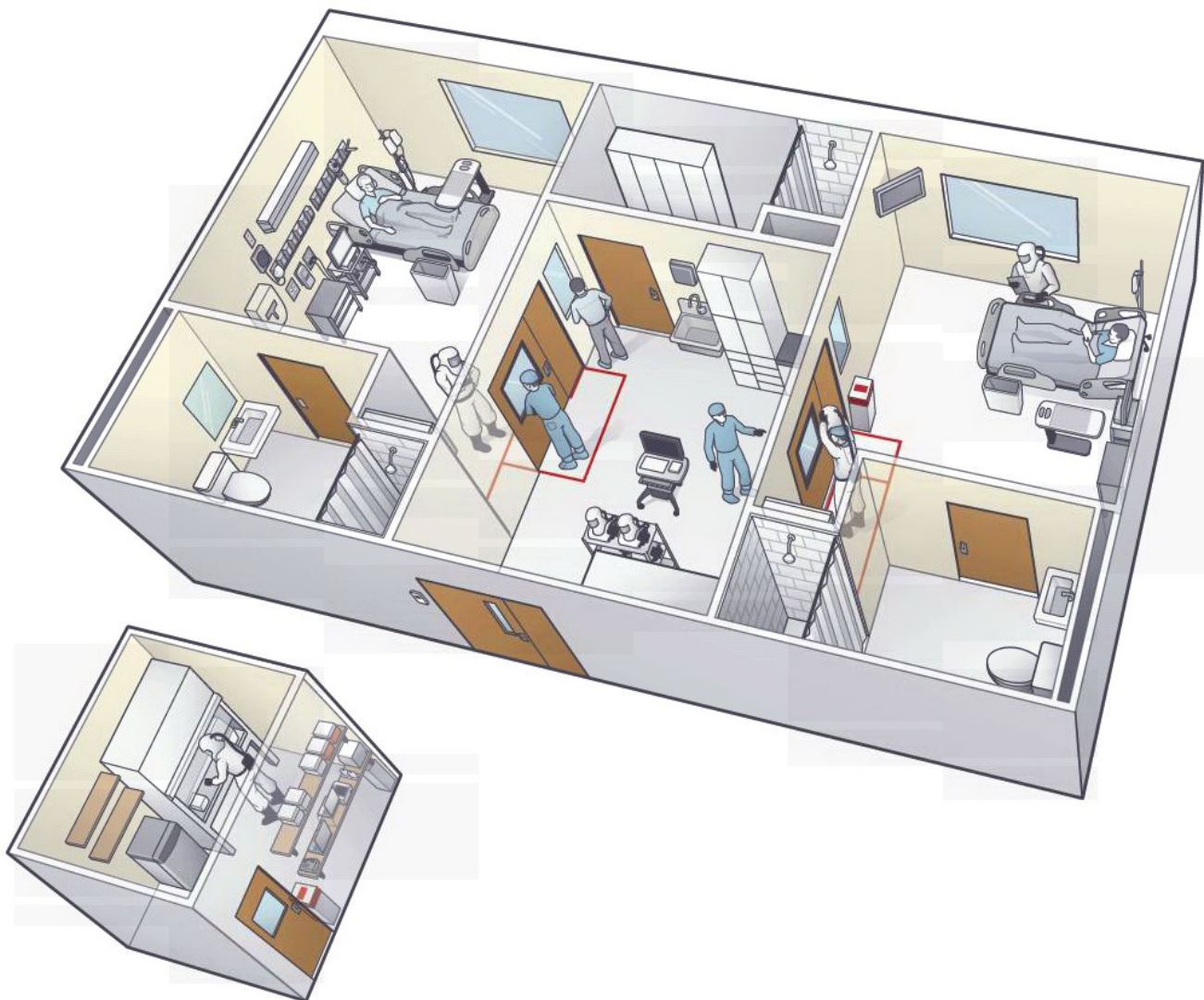
Background on Emory's SCDU

- Located at Emory University Hospital
- Serious Communicable Disease Unit was developed in 2002
 - An evaluation and treatment facility for CDC employees with exposures
- Activated twice prior to July 2014
- Specialty trained physicians, nurses, and lab personnel through didactic and scenario –based learning

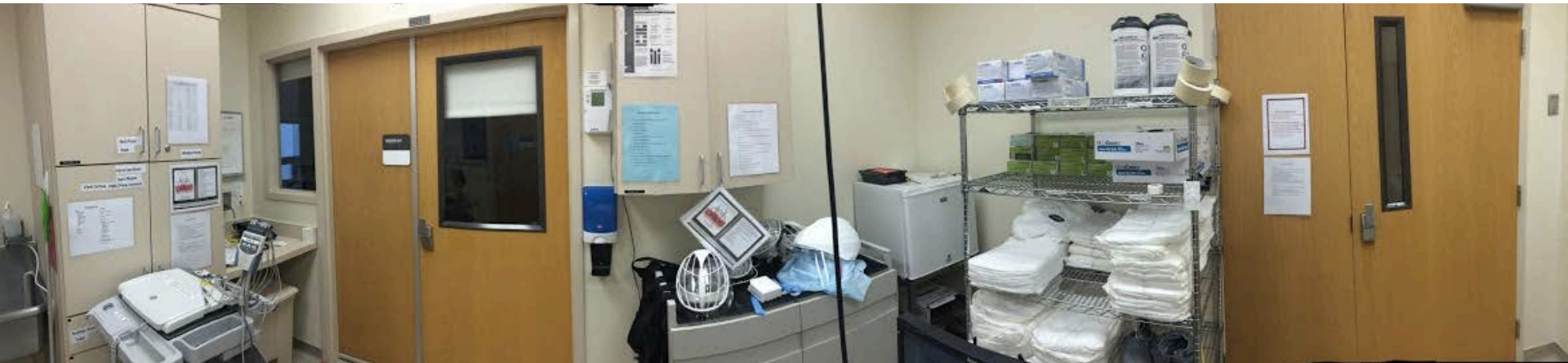


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Anteroom



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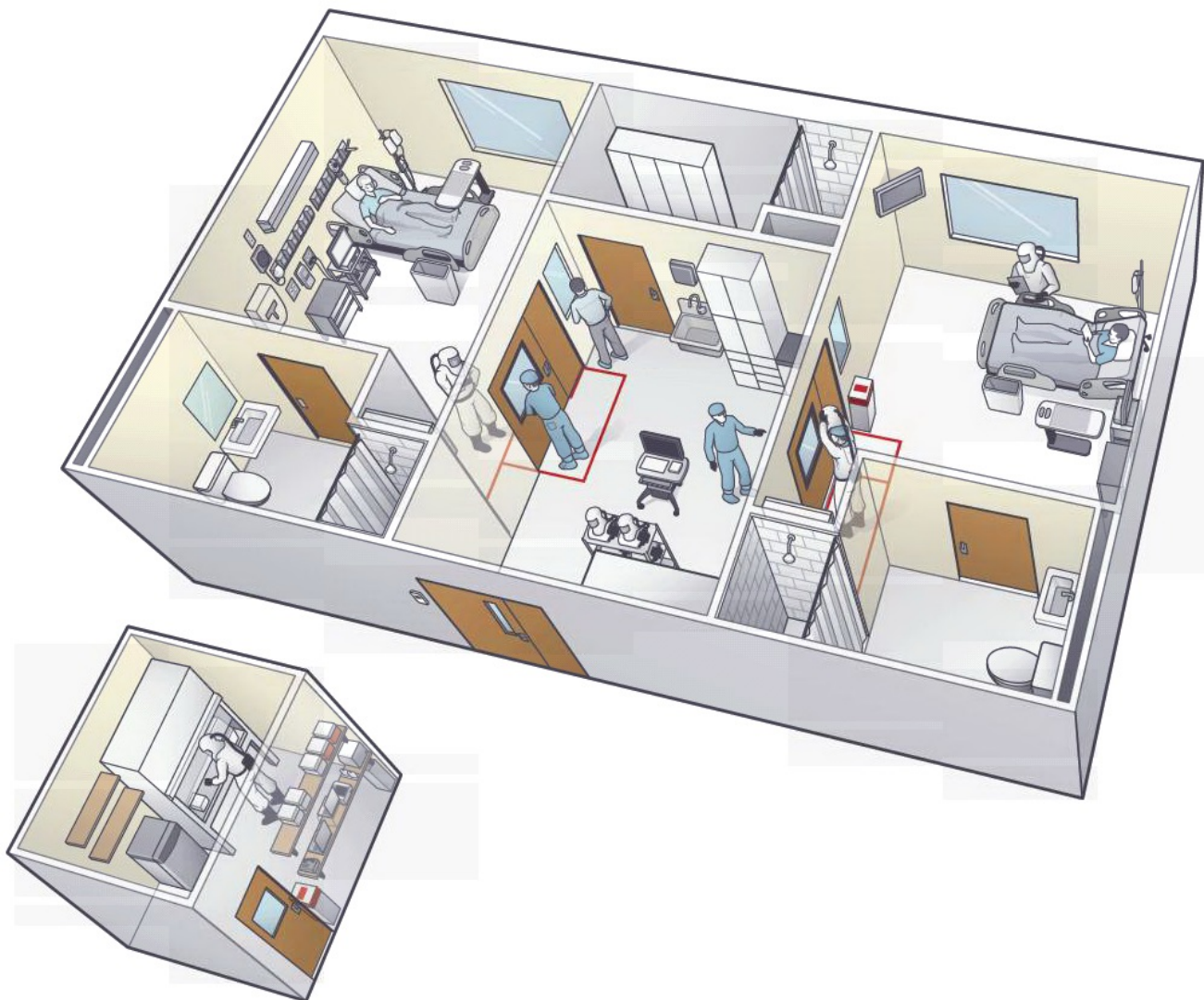
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Patient Room



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The Critical Role of Nursing

- The ability to provide high-level nursing care and supportive care made a significant impact
- 24/7 one-on-one nurses allowed for rapid response to changes and adjustment of care
- Ability to support patients in nutrition, physical therapy, and self care
- Emotional support
- Family support
- **Patient- and Family-Centered Model of Care**



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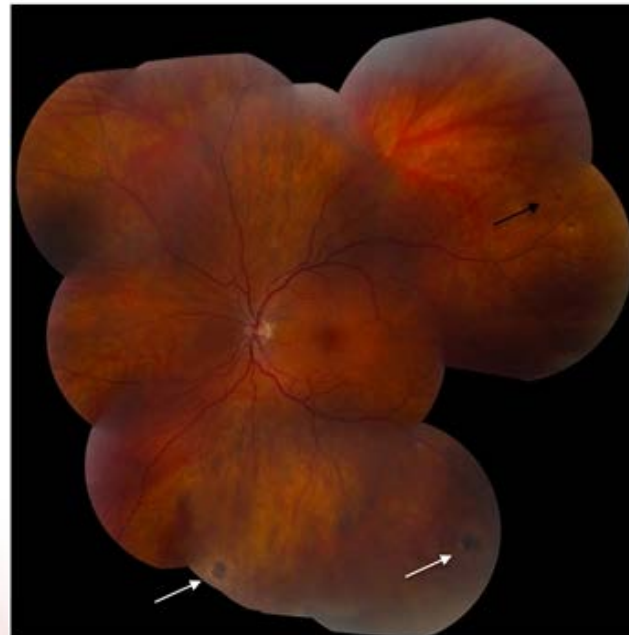


Post Ebola Syndrome

- Arthralgias/myalgias
- Abdominal Pain
- Persistent fatigue
- Anorexia
- Amenorrhea
- Parotitis
- Unilateral orchitis
- Visual problems
- Hair loss
- Hearing loss

Persistence of Ebola Virus in Ocular Fluid during Convalescence

Jay B. Varkey, M.D., Jessica G. Shantha, M.D., Ian Crozier, M.D., Colleen S. Kraft, M.D., G. Marshall Lyon, M.D., Aneesh K. Mehta, M.D., Gokul Kumar, M.D., Justine R. Smith, M.B., B.S., Ph.D., Markus H. Kainulainen, Ph.D., Shannon Whitmer, Ph.D., Ute Ströher, Ph.D., Timothy M. Uyeki, M.D., M.P.H., M.P.P., Bruce S. Ribner, M.D., M.P.H., and Steven Yeh, M.D.
N Engl J Med 2015; 372:2423-2427 | June 18, 2015 | DOI: 10.1056/NEJMoa1500306



Courtesy of Stephen Yeh, Emory Eye Center



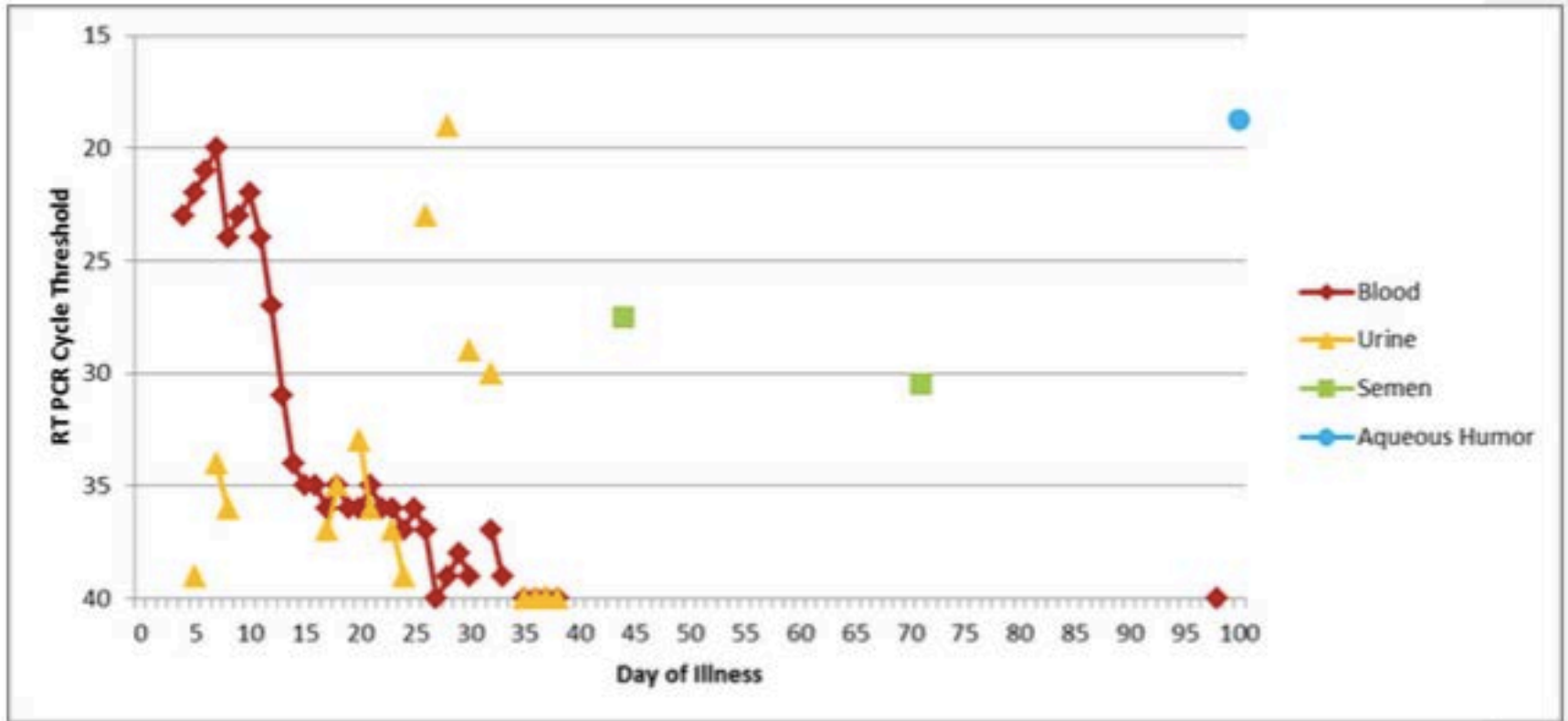
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STAFFING AND A CULTURE OF SAFETY



Culture of Safety

- **Shared** accountability for safety
- **Effective** and **assertive communication** is central to the safety of the team

The SCDU Team

- Leadership
 - Bruce Ribner, MD (Medical Director)
 - Sonia Bell (Administrative Director)
- Patient transport
- **Nurses**
 - **ICU trained nurse**
 - Clinical Nurse Specialist
- **Physicians**
 - Infectious Diseases
 - Anesthesiology/Critical Care
 - Nephrology
 - Nutrition



The SCDU Team

- Laboratory
 - Technologists
 - Pathologists
- Hospital Administration
- Environmental Services Staff
- Biosafety & Occupational Health
- Pastoral Care
- Security
- Communications



Daily Team Huddles

- Held everyday at 0715 when a patient was in the SCDU
- Agenda items included:
 - Clinical update and planning
 - Unit updates
 - Schedule updates
 - **Family Rules**



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“The Family Rules”

- **Follow all SOPs**
- **Ensure that others follow SOPs**
- **Report all accidents and near-misses**
- **Report any new symptoms**
- **Report any new medical conditions**



**KEEP
CALM
AND
FOLLOW
THE RULES**



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Monitoring Staff

- Only approved personnel allowed in isolation area
- All personnel required to enter twice daily temperature and symptom review into a online registry
 - 21 day after last shift in the unit

Direct Healthcare Provider (including Lab Personnel)

Symptom Questionnaire (Ebola Virus)

* Required

Employee Name: *

Employee ID #

Date: *

Month ▼ Day ▼ 2014 ▼

Time: *

Hr ▼ : Min ▼ AM ▼

Cell Phone Number

Best Contact #

1) Temperature *

in degrees F

2) Nausea/Vomiting *

- Yes
 No

2.1) If yes, please explain:

3) Diarrhea: *

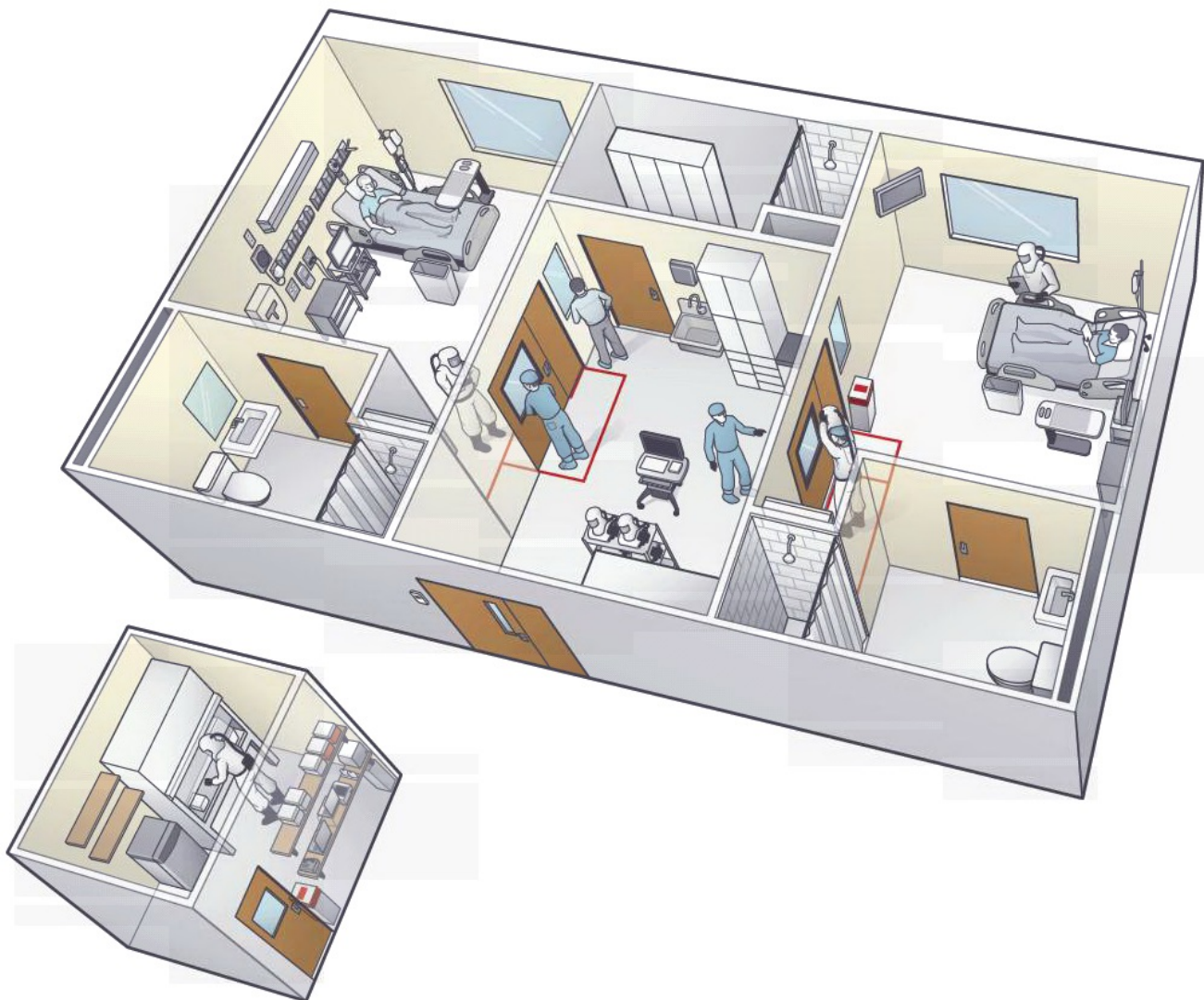
- Yes
 No

3.1) If yes, please explain:

4) Headache: *

- Yes
 No





Protecting Health Care Workers From Ebola: Personal Protective Equipment Is Critical but Is Not Enough

William A. Fischer II, MD; Noreen A. Hynes, MD, MPH; and Trish M. Perl, MD, MSc

- “Although PPE is effective at decreasing exposure to infected bodily fluids among health care workers, its presence is simply not enough”
- PPE itself can introduce risk
 - Proper training and competency in donning and doffing of PPE key for safety



<http://annals.org/article.aspx?articleid=1900481>



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Considerations for PPE in our Unit

- We required all staff to undergo refresher training from qualified instructors
- Removing PPE properly key to preventing contamination
- All donning and doffing of PPE was observed by another team member (buddy system)
 - Placed check lists in rooms to remind staff of proper protocols



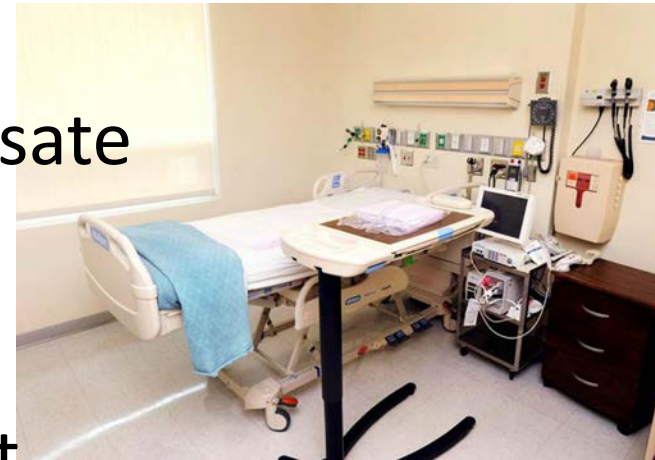
Assumptions for Staffing our Unit

- Only direct care providers in patient room
- No person enters room without mandatory training and demonstrated competence
- Autonomous practice (supported by experts)
 - Ventilator management
 - Continuous renal replacement therapy (CRRT)
 - Physical and occupational therapy
 - Environmental decontamination



Importance of Cleaning

- Found evidence of viral RNA on skin, in blood, urine, semen, endotracheal suctioning, vomitus, and stool
- No evidence of viral RNA in dialysate
- Did not find evidence of viral RNA in multiple room samplings
- Room cleaned at least every shift
 - Only the nurses and doctor entered room
 - **Cleaning is a team event**



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Ebola in the US: The One-Year Update

TRAINING FOR THE FUTURE

Emory Ebola Protocols

www.emoryhealthcare.org/ebolaprep

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Ebola Preparedness Protocols

[Overview: Purpose,
Commitment, Assumptions](#)[Triage and Risk Assessment](#)[Inpatient Care](#)[Appendices](#)[Support Documents and
Additional Resources](#)[Videos](#)[Presentations](#)

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Videos

This page provides videos to support the materials provided on this site.

- [Donning Personal Protective Equipment](#)
- [Doffing Personal Protective Equipment](#) Revised 11/14/14
- [Taking Off Protective Gloves \(Beak Method\)](#) Added 10/23/14
- [Cleaning Up Spills](#) Revised 12/4/14
- [Donning Personal Protective Equipment in the Emergency Department](#) Added 10/27/14
- [Doffing Personal Protective Equipment in the Emergency Department](#) Added 10/27/14



[Ebola Preparedness Protocols](#)
Donning Personal Protective Equipment: Emory Healthcare
Preparedness Protocols



EmoryHealthSource

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4,060

National Ebola Training and Education Center (NETEC)
\$12 million over 5 years

Activity A: Site visits and certifying facilities

Developing verification criteria (metrics) and tool

Performing annual site visits at the 10 Regional ETCs (and additional state ETCs)

Performing site visits in 50 states during first two years of contract

Activity B: Training Curriculum and consensus conference

Developing curriculum for in person, facility, and virtual training

Holding a consensus conference and development of standard practices and drills for state health departments

Developing an online repository for educational materials, certification materials, and exercises/drills

Activity C: Training and drills

Holding 6 trainings at NETEC (2-Regional ETC, 2-ETCs, 2-Assessment hospitals)

Performing unannounced drills and exercises annually at 10 Regional ETCs

Provide technical support for facilities conducting training and drills

Hosting Grand Round monthly webinars

Maintaining 24-hour hotline for clinical support



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