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Serious Communicable
Diseases Unit

POCT Testing for Ebola Patients: The Emory Experience

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On Behalf of "Team Ebola"

Serious Communicable Diseases Unit

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Personal/Professional Financial Relationships with Industry

External Industry Relationships *	Company Name	Role
Equity, stock, or options in biomedical industry companies or publishers	None	
Board of Directors or officer	None	
Royalties from Emory or from external entity	None	
Industry funds to Emory for my research	None	
Other	None	



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Culture of Safety

- Shared accountability for safety
- Effective and assertive communication is central to the safety of the team
- Direct patient care communication
- Daily team huddles



"Family Rules"

- I will follow all SOP's to the best of my ability
- I will ensure others follow all SOP's
- I will report any incidents or near misses
- I will report any new signs or symptoms
- I will report any new medical conditions



Ebola Laboratory

- Dedicated laboratory for patients under investigation (PUI's) and/or known positive patients is not necessary
- Evaluate risks associated with routine vs dedicated lab
- Must protect testing staff from blood and body fluid exposures
- Must provide clinically relevant test results



Known Positive Patients

- We preferred a dedicated lab for known Ebola or other highly infectious/highly lethal agents
 - Greater control of specimen disposition
 - Less impact for spills
 - Less angst among staff
 - Simpler waste management



Characteristics of SCDU Lab Staff

- Strict adherence to procedures
- Strict adherence to PPE
- Willingness to report incidents/near misses
- Adherence to occupational injury management monitoring requirements
- Willingness to be on-call separate from routine lab duties



Staffing the SCDU Lab

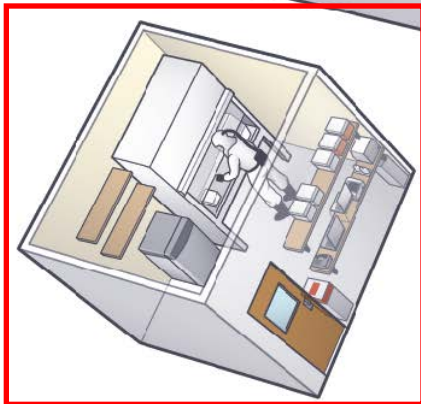
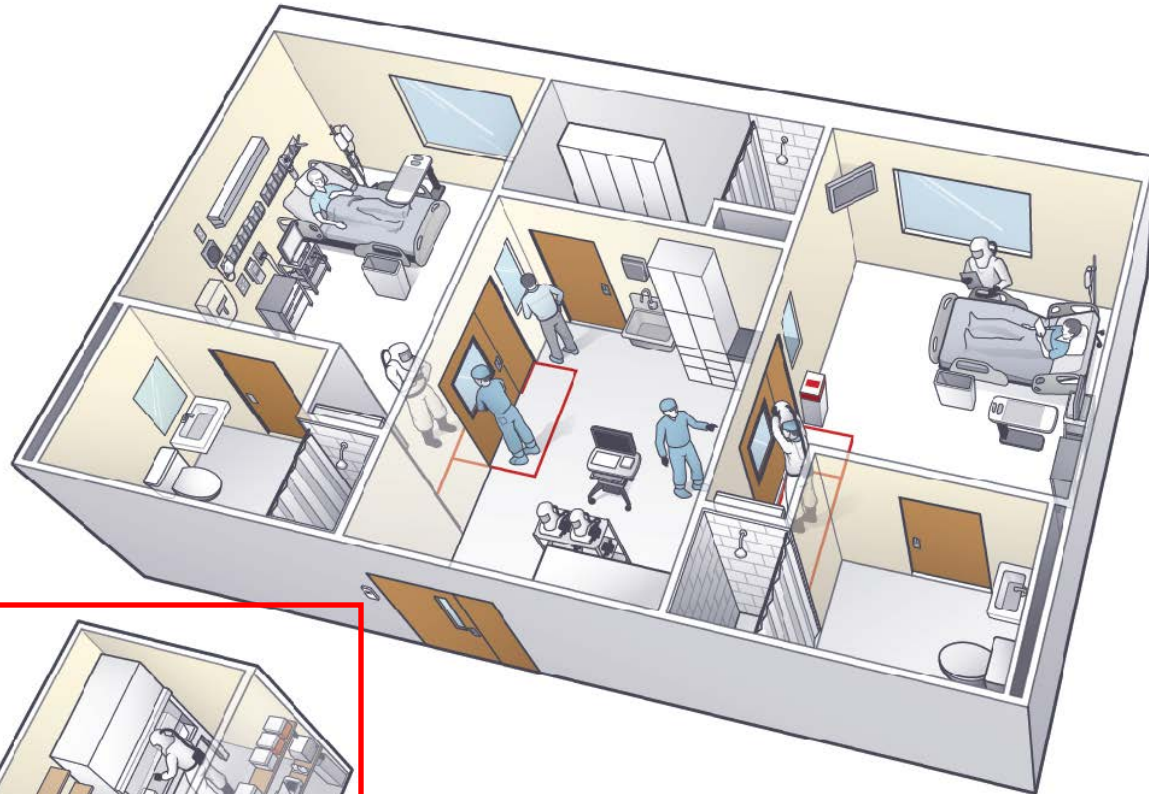
- On-call in 6 hour blocks 24/7
 - Testing staff member and safety person both on-call
 - Fatigue
 - Responsible for both known positive patients and PUI “rule outs”



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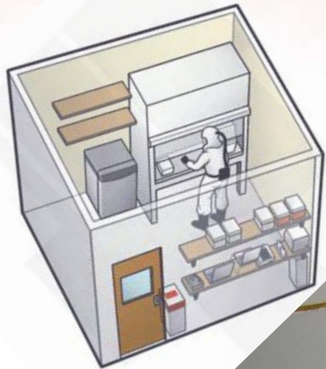
SCDU Lab





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SCDU Lab





Lab Menu Considerations

- Diagnostic testing (typically with confirmation by CDC)
- Comprehensive metabolic panel to monitor electrolytes
- Blood gas for monitoring respiratory status
- Enzymes for liver function
- CBC to monitor platelets and WBC
- Monitoring of phosphorus and magnesium during CRRT
- CK for possible rhabdomyolysis



SCUD Lab Menu

- pH, pCO₂, pO₂, Na, K, Ca, Glu, Lac, Hct, tHgb, O₂Hgb, COHgb, MetHgb, HHgb, T Bili
- ALB, ALP, ALT, AST, BUN, Ca, Cl, CK, CRE, GLU, LDH, K, Mg, Na, Phos, T Bili, tCO₂, TP
- WBC, RBC, Hgb, Hct, MCV, MCH, MCHC, Plt, MPV
- UA – Alb, Bili, Cre, Glu, Ket, Leu, Nit, pH, Pro, SP, Ubg
- GI Panel PCR, Respiratory Panel PCR, Ebola PCR (BT Panel, now BT-E under EUA), Blood Culture ID panel
- Malaria EIA, HIV EIA



Lab Layout Considerations

- Testing with open sample tubes performed in Class II safety cabinet
- Hematology analyzer does not require opening of tubes so not in safety cabinet
- Sample for PCR mixed with lysis reagent and closed pouch loaded in safety cabinet, then PCR performed outside of safety cabinet



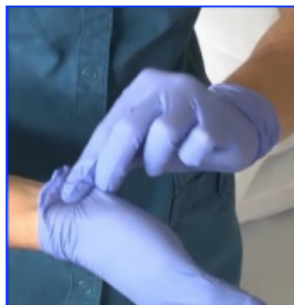
SCUD Lab PPE

- Paper scrubs
- Coverall
- Regular gloves
- Extended cuff gloves
- Booties
- PAPR hood
- Apron
- (Eyeglasses?!)





“Beak Method” Glove Removal Steps



STEP 1: Using one gloved hand, pinch and pull the base of the other gloved hand.



STEP 2: Use the middle finger to scoop the cuff of the glove.



STEP 3: Pull the glove inside out over all the fingers and thumb to form a “beak.”



STEP 4: With the beaked hand, pinch the opposite glove at the base and pull the cuff.



STEP 5: Roll the glove inside out and off the hand.



STEP 6: With the ungloved hand, use the index finger to pull the beaked glove off at the base of the beak and dispose into the appropriate waste container.

Always wash your hands after glove removal.



Donning and Doffing PPE (for Lab)

- Standard operating procedures for donning and doffing PPE
- All donning and doffing of PPE was observed by another team member
- Placed visual cues to remind staff of proper protocols



Why full PAPR in the SCDU lab?

- Comfort!!!!
- Better vision
- It is what the staff trained to use
- Unknown pathogen



Lab Waste

- Waste in safety cabinet collected in sharps container
- Other waste in biohazard bag in foot operated waste bin
- Bags have water added (steam source for autoclave), goose-necked, wiped down, secondary bagged, wiped down, autoclave bag, rubber band
- Canisters marked either “positive” or “negative” containing lab waste



After Testing ...

- Interior and exterior surfaces of safety cabinet, table, stool, etc. cleaned with germicidal wipes
- Floor cleaned with germicidal wipes
- Doff PPE
- Periodic decontamination of the lab (“HPV” or hydrogen peroxide vapor)

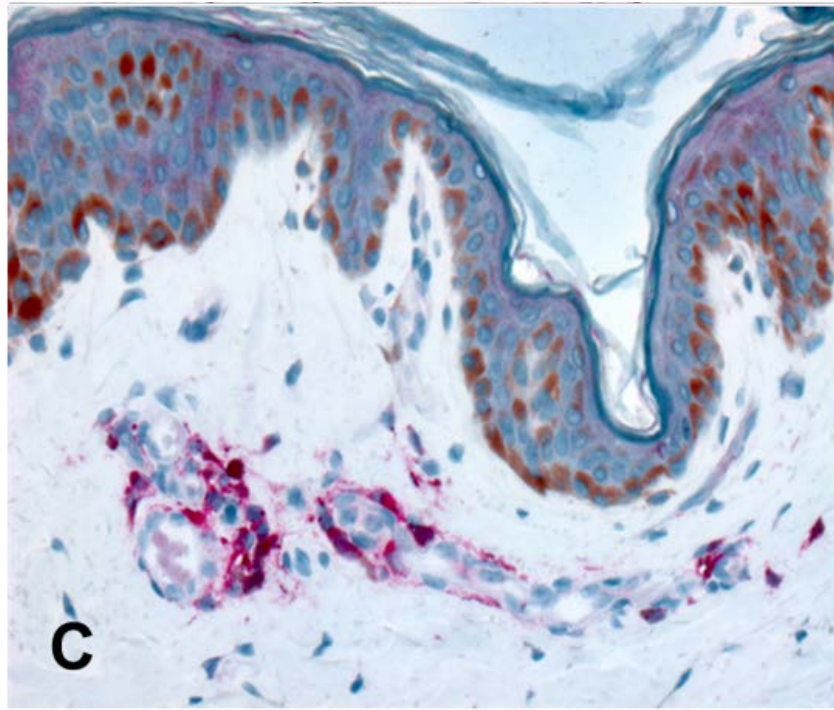


Image courtesy of Dr. Sherif Zaki, CDC



Blood Bank Support

- Transfusion and parity history are important
- Emergency release units are available for patients
- Plasma containing products should respect ABO, if possible
- Blood typing may be performed by slide agglutination for ABO (competency and proficiency?)



Pearls/Summary

- Risk assessment for lab preparedness plan
- Provide high quality clinical lab testing that adheres to regulatory requirements
- SAFETY FIRST!!!

Our Team

• Emory Nursing

- Toni Ash
- Chris Barnes
- Jason Calhoun
- Lauren Chapman
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- Marolyn Jones

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- Randall Powers
- Emily Ryan, PhD

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- Paula Desroches



Our Team

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- Dan Stark

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- Porcia Jones

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- James Cain
- Roderick Davis
- Tyrone Johnson
- Tyrone Pickett
- Anthony Shaw
- Tenina Truesdale

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- Sam Shartar

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- Carlos Del Rio
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- Rachel Friedman
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