SUPPLEMENTAL MATERIALS for:
Experience of Chicagoland acute care hospitals in preparing for Ebola virus disease, 2014-2015

Susan C. Bleasdale; Monica K. Sikka; Donna C. Moritz; Charissa Fritzen-Pedicini; Emily Stiehl; Lisa M. Brosseau; Rachael M. Jones

---

Semi-Structured Interview Instrument

Introduction

You have been asked to partake in the research because you participated in preparations for Ebola Virus Disease.

I anticipate that this interview will take less than 60 minutes to complete. There is minimal risk for participation in this telephone interview. If this conversation is recorded, your identity will be concealed in transcriptions, and the recording will be stored on a protected fileserver and will only be accessed by members of the research team. Your identity will also be concealed in notes taken during this interview.

Participation is strictly voluntary and you may stop participating at any time. [*If you are an employee or student at the University of Illinois, your decision whether or not to participate will not affect your current or future dealings with the university]*.

Upon completion of this interview, you will receive a $30 gift card.

Do you have any questions about the research activity?
<Answer any questions>

Do you consent to participate in this interview?
<If the participant does not consent, thank him or her for his time and discontinue the conversation.>

Do you consent to have this interview recorded?
<If the participant does not consent, continue the interview without recording.>

Theme 1: Participant Characteristics

1. Can you tell me about your role in your institution?
2. What was your role in Ebola preparations at your institution?
3. Why did you become involved with Ebola preparations?
    - *Why did you volunteer?*
    - *What in your background or experience was needed by the institution?*
4. Does your institution serve a population considered at high risk of Ebola Virus Disease?

Theme 2: Institution Organization and Culture

1. Who else participated in Ebola preparations at your institution?
    - *What types of expertise or roles were represented? Most institutions included these departments: infection control, emergency preparedness, employee health, CEO/CMO. How were these roles involved? Were there any groups involved that were exceptionally challenging or helpful to work with?*
    - *Did you have a biosafety person?*
    - *Had this team worked together before?*
    - *Was incident command activated?*
    - *How was communication within the team?*
    - *How was communication from the team to others?*
    - *How did the planning team/staff adapt to changing guidelines?*
2. Were the activities of the Ebola preparation team supported by hospital administration or leadership?
    - *Did they provide sufficient financial resources for activities?*
    - *Did they provide leadership for activities?*
    - *How did they demonstrate institutional commitment?*
    - *Was sufficient staff and employee time made available?*
    - *Did training and preparations affect patient care flow?*
    - *Were there any novel protocols or procedures developed during Ebola preparations? Can you describe some?*
    - *How easy was it to get it approved? How did staff adapt to these new protocols?*
    - *Ethical challenges in planning?*
    - *What was the timeline for development of local institution guidelines?*
    - *How do you feel was CDC guidance initially?*
    - *Can you describe any constructions that your facility had to prepare for a possible patient?*

Theme 3: Training Experiences

1. Describe who was trained as part of your institution's Ebola preparations?
    - *How many people were trained?*
    - *How were these individuals chosen? Did you include residents/students/ trainees/?*
    - *What types of skills were represented among those trained?*
    - *Did you find a need to consider physical capabilities a factor in those selected for training?*
    - *What staff concerns were there? Did staff have concerns about participating and risk to family members? Did you have a plan to quarantine or evaluate them?*
2. Did the training focus on the use of personal protective equipment, or did it include training on care activities and skills?

- *How long were the training sessions? What was the rationale for the content of the training?*
- *If the training included skills, which were included? For example: cleaning patient care areas, starting IVs, intubation, resuscitation, taking x-rays, dialysis hook-up, cleaning, blue tooth stethoscope, telemedicine, tablet computers*
- *Did you include observers for PPE donning and doffing?*

3. What types of training did, or does, your facility offer?
   - *For example: Hands-on in group or individual setting; computer-based training; instructional videos; training booklet; table top exercises*
   - *Who delivered the training? Did you use in-house trainers or hire outside trainers?*
   - *Where did the training materials come from? For example: Developed in-house, CDC, local agencies, etc.*
   - *What were the qualifications of the trainers? How were the trainers trained?*
   - *In what settings was the training delivered? For example: simulation lab, patient care room, class room, etc.*
   - *How frequently are you providing refresher training?*
   - *Prior to Ebola, did your institution provide training on standard PPE? How did the Ebola PPE training compare to this?*
4. How do you know if the training was effective, and which aspects were more or less effective?
   - *How was competency assessed?*
   - *How has retention been assessed?*
5. If you had a confirmed or suspected Ebola patient at your facility, how did you feel about your institution's response?
   - *How confident were you that staff applied appropriately methods from training in donning and doffing PPE?*
   - *Where there any events that occurred that had not been addressed in training? If so, how were they handled?*
   - *What aspects of patient care did you feel the staff was more (or less) prepared for?*
   - *How did you handle family of the suspected patient?*
6. If you haven't had a confirmed or suspected Ebola patient at your facility, do you feel your institution is prepared?
7. What lessons were learned at your institution to improve training for Ebola response?
   - *What would you do differently?*
   - *What challenges did you face?*
   - *How did the experience compare to that from previous emerging infectious disease threats, like pandemic influenza or SARS?*

Theme 4: Experience with Personal Protective Equipment

1. Explain the process you used to select personal protective equipment?

- *Which recommendations and references did you consider from outside organizations? For example: CDC, NIOSH, OSHA State or Local Health departments, Emory or Nebraska Medical Centers, Professional Societies like the Infectious Disease Society of America, American Association of Critical Care Nursing, etc.*
- *What did you take from each guideline?*
- *Which decisions about PPE, if any, were impacted by pricing or supply issues?*
- *Were the proper PPE available for training? How did this affect employees' confidence in the training provided?*
- *How did your institution respond to changing PPE guidelines from federal agencies? How did you perceive the comfort of the staff to the changes?*

2. Who had input into the selection of PPE for use during the treatment of Ebola patients at your institution?
   - *For example: infection control, employee health, emergency management team, clinical educators, central supply, purchasing, employees, administrators, etc.*

3. Did your institution have different levels of PPE for different patient scenarios?
   - *Can you describe the scenarios and PPE types used?*
   - *Had you used these pieces of PPE in your facility before?*

4. Did you find any pieces of PPE particularly difficult for employees to use?
   - *Based on your experiences, are you going to maintain or change the PPE used?*

Closing questions

1. What did you and your institution learn from this experience?
   - *How are you using this experience to stay prepared for another emerging infection?*
2. What role do you think the media played during the Ebola scare?
3. <u>For treatment centers only:</u> can you describe any concerns from patients about your hospital being an Ebola treatment center? Did you have any patient complaints or decreased number of admissions?
   - *Do you continue to be a designated treatment center?*
   - *When did you stand down?*

That is the end of the questions.

- Is there anything else you would like to add or expand upon?
- Do you have any questions for us now?
- What is your preferred e-mail address for us to send you the gift card?
- Would it be possible for you to help distributing the online survey?

Thank you so much for participating in our study.

Final codebook used for coding of interview transcripts

Parent Code 1. Interviewee Role The role that participant/interviewee had
A. **Job** – Indicates job title and routine job responsibilities B. **Role** – Indicates role and responsibilities during Ebola preparations C. **Rationale** – Indicates the reason that participant participated in Ebola preparations, such as volunteer and/or job duty
Parent Code 2. Management Response The members and organization of the response team
A. **Team members** – Indicates the job titles, expertise or roles of individuals who participated in Ebola preparation B. **Organization** - Indicates how the response team at the institution fits within the larger organization or network; ex. Role of network/parent hospital system, relationships of team members C. **Communication** – Indicates the nature of internal communication within the team or communication to trainees: frequency, quality, dynamics D. **Internal Resources** – Resources given to management team, trainers or trainees including: financial, time, physical plant, etc. (excluding PPE supply) **E. Supply** – Indicates supply of PPE, including shortages or availability with selected PPE F. **Response Plan** – Indicates description of institutions response plan including level of care delivery, management of anticipated scenarios, logistics, incident command, protocols for novel care delivery
Parent Code 3. Changing Dynamics Describes changing dynamics in regard to changing PPE or care delivery guidelines from internal or external organizations/institutions
Parent Code 4. External Agencies Describes utilization and perceptions of external agencies including communication, resources, guidance
A. **CDC –** Indicates description of CDC resources used, perception of guidelines and assistance, communication B. **Biocontainment Units –** Indicates description of institutions with biocontainment units (Emory, Nebraska, NIH) resources used, perception of guidelines and assistance, communication C. **Local Public Health Agencies** - Indicates description of local public health agencies resources used, perception of guidelines and assistance, communication D. **External Consultants –** Indicates description of external consultants used for guidance or assistance E. **Other** - - Indicates description of other external agency (ex. NIOSH, OSHA, Illinois Med District, Local Ebola Treatment Centers, MCHC) resources used, perception of guidelines and assistance, communication
Parent Code 5. Trainer Characteristics Characteristics of trainers
A. Trainer – Indicates the roles of trainers regarding their training tasks, and descriptions of their permanent institution job title/description

B. Selection – Indicates if participation was mandatory or voluntary, or other reasons they were identified for role
Parent Code 6. Trainee Characteristics Characteristics of participants in training
A. **Participants** – Indicates the roles of participants B. **Selection** – Indicates if participation was mandatory or voluntary, or other reasons they were identified for participation C. **Physical** – Indicates whether participant selection considered physical abilities
Parent Code 7. Training Describes topics associated with Ebola PPE and Care Delivery Training
A. Content – Indicates the content of the training including care delivery skills, PPE Donn/Doff, screening, use of technology, transport, cleaning, etc. **B. Modality –** Indicates the details of training implementation including: duration, location, use of trained observers, methods (table top, drills, online) C. **Evaluation** – Indicates method for evaluating training effectiveness (competencies), or participant performance during training activities D. **Retention of Skills -** Indicates any methods used to evaluate skill retention or ensure skill retention including modality of skill evaluation, frequency and Stand Down (step down of training for some staff at end of preparations) after training period was completed E. **Historical Training** – Indicates all aspects of training that was performed before Ebola preparation including modality, content, evaluation and skill retention
Parent Code 8. Suspect Patients Describes any experience with suspect/confirmed patients (not including acted drills)
Parent Code 9. Operational Disruptions – Experienced or Potential Indicates events that disrupted routine operations during preparations/outbreak
A. **Census –** Indicates effect of training and Ebola preparations on the hospital census B. **Routine Operations** – Indicates the effect of preparations on routine operations
Parent Code 10. PPE Describes PPE selection, supply, use, efficiency
A. **Use** – Indicates what PPE was used (named piece of equipment), including in training, or post training. Includes discussion of PPE Level (wet/dry, 1/2/3). This does not include PPE use before Ebola prep (Code 10F for previous PPE use) B. **Decision Makers** – Indicates who participated in PPE selection C. **Selection Criteria –** Indicates criteria used in selecting PPE including cost, maintenance, functionality (vision, ability to perform tasks) D. **Alternative/Innovation** – Indicates description of use of alternate PPE based on supply, preference, etc. E. **User Experience –** Indicates description of staff experience using PPE, including functionality in care, ease of don/doff, temperature control F. **Historical PPE Use** – Describes staffs previous experience with PPE before Ebola preparations. This can include what PPE was previously used, staff user experience with PPE before Ebola preparations.
Parent Code 11. Challenges/Lessons Learned/Comparisons Describes barriers and challenges, and solutions to these barriers and challenges
A. **Challenge –** Indicates a challenge, gap discovered, or barrier identified to/in training

B. **Solution** – Indicates solutions developed; new protocols or plans for future response and training (regarding new emerging infection preparation and response). Protocols/plans developed for Ebola response should be coded as 2F. C. **Comparisons** – Indicates a comparison with preparation for previous emerging infectious diseases
Parent Code 12. Emotions/Perceptions Indicates an expression of emotion including confidence, security, trust, anxiety, fear, confusion, risk, etc. This includes personal emotion and perceived emotion from staff, management, public, or institutions as well as perceived population risk associated with Ebola
Parent Code 13. Support for Employees/Occupation Health Describes support plans for employees associated with outbreak including quarantine, medical evaluation and housing
Parent Code 14. Ethical Issues Any ethical issues identified for agency/institution, staff, or patients
Parent Code 15. Media Indicates reference to the media

Focused Conversation Guide: Personal Protective Equipment

Objective Questions:
Which pieces of PPE were used?
How were pieces of PPE selected?
What were the challenges, if any, to the use, including donning doffing, of selected PPE?

Reflective Questions:
What do the responses remind you of?
Were you surprised by the responses? Why?

Interpretive Questions:
What motivated the choice of specific PPE ensembles?
Do these responses suggest a value for multi-level protective equipment?
How would you characterize the organizations decision making process?
Are there patterns/similarities to PPE choice and/or use?
In what way were challenges to PPE acquisition a barrier to preparations? If any?

Decisional Questions:
What do these responses tell us about how PPE should be improved?
What do these responses tell us about the guidance needed to select PPE for emerging/high consequence infections?

Focused Conversation Guide: Training

Objective Questions:
1. How was training delivered?
2. Who developed training?
3. Who delivered training?
4. How was the effectiveness of training evaluated?
5. What was the content of training for Ebola patient care (topics and skills)?
6. What technology was used for training, if any?
7. How were skills maintained over time?
8. What institutional support was provided for training?

Reflective Questions:
1. Were the appropriate topics and skills addressed in training?
2. What topics and/or skills do you think should be included in training?
3. What aspects of training appeared to be positively received by trainees or by the institution?
4. Were you surprised by the responses? Why?

Interpretive Questions:
1. How did knowledge or risk perceptions influence the design of training for Ebola?
2. How did healthcare workers' knowledge affect training participation and compliance?
3. What were barriers to training? Consider the institution and individuals.
4. What did the Ebola training experience say about training for routine infection prevention?
5. What does this tell us about Ebola preparedness/training in Chicagoland healthcare facilities?

Decisional Questions:
1. What types of training should be used going forward to prepare for emerging diseases/high consequence infections?
2. What are the characteristics to consider when creating training for PPE use for emerging diseases/high consequence infections?
3. Training is designed to alter worker behavior; what must an institution prepare to ensure workers can employ the desired behavior?
4. What are good measures for determining worker and institutional preparedness for emerging diseases/high consequence infections?

Additional illustrative and extended quotations.

Response to CDC Guidance
"Well the CDC guidance was inadequate at the time. […] and the administration of the system felt that we were […] just gonna follow the CDC guidance which was clearly, as time shows, was clearly inappropriate and inadequate." [F10]
"You know, I hate to tell you, but I thought the CDC was totally unreliable in this event, including the how to don and doff PPE." [N26]
"I think once [healthcare workers] started seeing the level of steps that were taken to protect them, I think the anxiety level decreased quite a bit, but I do think the delay in education caused some unneeded anxiety. It was necessary to be anxious about it, but it was not a needed step in the process. (laughter) It would've been nicer to be able to smoothly move into [the training], but the truth was even if we had jumped immediately into the education again, equipment switched part way through and it was absolutely for the safety of the staff. We looked at [the CDC recommendations] and said we don't like it, and there were no guidelines at the time, nobody saying this is what you need to do." [B17]
"I think one of the problems here for the staff is that because of the change we didn't, and because it required new equipment, we had to wait until we had the equipment, we couldn't train the use of the equipment without having the equipment here, and that caused a lot of stress among our staff thinking that we weren't responding." [B17]
"[A]nd you know what? That messed with our credibility because first I'm telling them standard precautions. Standard, what you normally do, and then all the sudden I gotta go to a meeting and say no you gotta look like a space man. And they're looking at me like 'what do you mean I gotta', so it's messed with our credibility. I did exactly what CDC told me to do and they made us look bad. So before they go putting something out they need to know that, again that ivory tower kind of thing, you're not in the trenches and you don't know how people are reacting in the trenches. I'm in the trenches." [B2]
"[W]hen we first started having the conversations of Ebola, CDC was saying oh standard precautions, no big deal, basically is what they were saying. And then they changed everything around to freak everybody out. And I'm not being shy about that. I, still, with the next great thing that comes out of here, I can expect that same, there's that, they get the pressure from the media, the media has the information before the hospitals do and then we're asked to respond. it's very difficult with the way things get rolled out from CDC." [B2]
"We had to do three different trainings. Initially we developed our PPE protocol based on the existing CDC guidance, which in my opinion wasn't very good, so we just went with it though because that's what we had. We might've tweaked it a bit because we were concerned about any, we didn't want any uncovered skin, so we did tweak it a bit. […] Then we moved to a configuration that consisted of a one piece suit, a PAPR with a hood that had a double shroud, and then of course the boots and gloves and that kind of stuff. So then we had the visit by the CDC team […] and of course they had their recommendations about our PPE so we had to tweak it yet again. So that's why I'm saying we had three, during the course of when things were really active with Ebola, we had three different PPEs that we had to train on. The caregivers weren't particularly happy (laughter) that they had to go over this again and again and again." [P30]
"Well we actually looked at what CDC had and we kind of enhanced (laughter)[…]. I guess we weren't at ease with what CDC first came out with." [E15]

“They hated it and I, number one, hated it. [CDC] were changing like every other day. And that was part of the major problem and it’s happened before with other outbreaks, is that you know we didn’t have the correct PPE.” [I22]
“[W]ell, the CDC didn’t recommend, at that time, the appropriate isolation and training for Ebola virus. they were telling us that the usual airborne contact isolation was all we needed to do, so that’s what we had and that’s what we depended on and it was not adequate. As time went on and as the Board of Health and the CDC began to fine tune what we really needed to do, and the infectious disease community began to really highlight the lack of appropriate training and direction from the CDC, that we finally began to coordinate what was appropriate isolation. And again our corporate people and the epi consortium were getting entirely different direction and feedback from the CDC than they were getting from me.” [F10]
Impact of PPE Shortages
“We just tried to pick a level [of PPE] that we could get our hands on that was gonna be adequate. Other than the regular HAZMAT suits, and I’m drawing a blank on what level they are, but they’re higher than what we would’ve needed for Ebola but that was our last resort option if we ran out of the other.” [I18]
“I had to cannibalize other things. I couldn't get shrouds. At that point I had to cannibalize the ortho equipment from surgery to get shrouds so that the neck was covered. I had to cannibalize the GI lab to get longer gloves and things like that so that I knew and felt comfortable that everybody was covered going into those types of room.” [I22]
“[A]nd unfortunately you couldn't purchase the appropriate garb at the time. It suddenly was used up, if you would, by every other hospital in the area who suddenly recognized the need for this. So it took us a while before we were able to get everything together.” [F10]
“So in terms of the biggest issue […] was the challenge we had with procuring the personal protective equipment because in the early days […] there was a run on PPE. All the hospitals bought it and it was hard to procure any so we had to modify and invent stuff internally. […There was] a challenge in procuring the PAPRs so we used the orthopedic, because the Zimmer hoods, that we were able to modify […].” [E07]
“I think the challenges are kind of the ones that we always face as a small community hospital. We didn’t have a lot of the resources that some of the bigger facilities did. We didn’t really have like secure teams in place. You know the PPE and access to that all was like the things that the CDC were recommending like the face masks, that sort of thing, those were hard to come by as a smaller hospital that you know, in general we can't really compete with the big dogs if you will. (laughter)” [A3]
“[T] the [hospital] system developed more of a coordinated incident command where we started having conference calls, all the facilities. Initially when things were at a very heightened level of awareness, we were having those daily in the morning. […] [W]e were all in the same boat, that we’re having a hard time getting [PPE], so we were looking at all of our resources to see how can we pool them, how can we share them, what can we use in place of what we would think would be ideal. That type of a thing.” [C4]
“[T]hat was one of our initial struggles, that we didn’t have proper PPE equipment, so pulling together pieces from different areas to ensure that we had proper coverage. That was a hurdle for us in the beginning.” [G14]

“[W]hen [CDC] raised [the recommended PPE] up and put on N95, I said ok, we’re still good with that N95 respirator. And that's where it ended because we didn’t have, like I mentioned, we didn’t have PAPRs.” [A1]
“Had something happened, I think we would’ve had the PPE to get through it, but I don’t necessarily know that it would have been the most protective.” [A3]
“It was just extra-long gowns and the appropriate knee high shoe covers, those were the things that were in really high demand. And if we hadn't already been ordering them, the companies weren’t shipping them to you. They were filling the orders of hospitals that had already been on their ordering list.” [B17]
“I think [PPE shortage was] one of the worst barriers that we addressed. It was horrendous, and I think there needs nationally better planning around this. […] We were aware of a rehab facility that had […] ordered and received 1,000 of the suits. We couldn't get our hands on a suit for the life of us. You know, and it was like, well, how come a rehab facility was able to get this and we can't get it, you know? So there was a lot of barriers, especially with trying the PPEs. To begin with, we took what we could get, and wasn’t always happy with the suit but at least it provided training materials for us to train with. […] And then when things kind of let up a little bit, and manufacturing increased, we were able to pick exactly what we wanted. “ [D8]
“I mean we eventually had enough supplies at that point, but for training we would always just kind of like reuse a lot of our suits and gowns.” [E15]
“Our ultimate response in having supplies was we’re associated with [a large national provider network] […] so material, supplies, and equipment we were quickly able to identify facilities in our corporation that would be able to provide that for us. […] [W]e could have been replenished from [affiliated hospitals] at any time, but what we did in that interim though there was some creativity with the use of PPEs.” [G11]
“We pieced together everything that we could what we had, and that’s how I got the ortho team involved because that day, so what if this patient came in tonight? I don’t have stuff we need, so this is what we’re going to use to ensure that we’re covered head to toe.” [G14]
“We ran into a lot of problems with items not being available or being back ordered. And I know that was difficult, and that definitely delayed training in a lot of cases because we didn’t have it to be able to train with.” [Q31]
“I think one of the problems here for the staff is that because of the change we didn’t, and because it required new equipment, we had to wait until we had the equipment, we couldn’t train the use of the equipment without having the equipment here, and that caused a lot of stress among our staff thinking that we weren’t responding.” [B17]
Financial Support
“The Cadillac of everything. I mean the hoods alone, with the fans in them, and the fanny packs and all this kind of stuff, the gowns. I don’t think anything was based on price.” [B2]
“[T]he CNO of the hospital basically finally said, ‘I don’t care what the price is we just have to do this.’ So it did take a little convincing to get that mindset in of ‘we need to be prepared because we don’t know what's gonna happen,’ and we wanted to make sure we had enough to protect staff because if you don’t have the protection for staff, they’re not gonna come to work and they’re not gonna want to do that.” [H13]
“[T]here was no hedging on the commitment of the organization for the safety of all of our employees across the board. And, that when you talked earlier about finances, there was no

question that whatever we needed to be ready to take care of patients, the institution would find a way. And we did." [N28]
"[I] think they just got the money because no hospital wanted to be caught not doing anything about it, so it was easy to get the money for the equipment." [K20]
"[A]s long as we could stay, like with finance, as long as we could say what we needed and why, they were agreeable with that." [I18]
PPE Performance Evaluation
"This hood doesn't have any labels or anything. It is an impermeable like type of material but there's no signage or anything." [F12]
"[S]upply chain was actually taking red Kool-Aid® and testing everything before they'd even bring it up." [N26]
"[W]hen we talk about donning and doffing the PPE, since there wasn't one national brand that everyone used, we were doing a lot of trial and error. So in our simulation lab we were trying on the different PPEs, squirting each other with this dye colored water and seeing if there were any penetrations or any leaks that we would have to rethink how we applied the PPE and the various steps." [E7]
"…then it was, ok, 'How do we do this in a way so that the PAPR it's tucked into the Tyvek™ suit?' 'How do we do this so that it doesn't leak around the edge of the Tyvek suit?' […] [S]o we just did trial and error until we came up with something we thought, 'yup, that looks good.' And then we had our staff, our volunteers: What do you think?,'Can you get in?, Can you get out?, How should we modify it? Does this work? Does this not work? That's how we did it." [N26]
"We decided to enhance our own PPE and then I guess just through testing and so forth. I know we did a lot of testing with just spraying wet liquid or whatever that we had on the PPE that we were working with, and at times you know the PPE failed so we actually made sure that we upped our level of PPE, you know, for fluid resistant type gowns and hoods and so forth. […] [T]he hardest thing we had to [do] was actually make it more comfortable for the staff to be in it at a certain period, for a certain length of time. So that's why [for one unit] we actually went with the PAPRs. […] [F]or the emergency department, our longest time was about, ooh gosh, at least over two hours or so because we were assessing this one patient. And the equipment we had, even for training, I mean people were just, it was very claustrophobic, so we decided to research and look into Zimmer helmet." [E15]
" [T]he first time through [PPE selection], one of the big concerns was with the hood. They would fall in front of people's faces. […] You didn't have good peripheral vision, so you were looking out very tunnel vision and it just wasn't working. It didn't seem safe that you could be bumping into things, tripping over things. The masks were fogging up. They were very warm and very uncomfortable. and that was what sparked the change to use, we used these Zimmer helmets that they use in the operating room with hoods over them. […][C]ontained in the helmet is a fan so it got air circulating under the hood. the hood itself has a larger range of vision. It was a world of difference […]. [The hoods and mask] were just incredibly uncomfortable. The temptation was to always touch that mask and move it into the right position, and the thought was just what we would end up with is people breaching PPE because it was just too cumbersome and too uncomfortable and they couldn't see what they needed to be doing." [B17]

“They just found that some of [the PPE], when they were testing them out, they didn’t think were as effective as they’d like them to be, or the equipment, the equipment was difficult to manage and be safe at the same time. So they switched, we switched some equipment partway through the training, and people were retrained to use the new equipment.” [B17]
“[W]e even had one of our employees volunteer to let us dress him head to toe, and try on different things. He was like, we called him our little ‘Ken’ doll because we dressed him and we were like yeah, hopefully this is good. But, yeah that was our, a big concern, that PPE and then also having it available immediately, not somewhere in a closet.” [G14]
Perceptions of Risk and Safety
“[...] kept thinking about the nurse that was in Texas that seemed to have had all the protection that she needed but she still got exposed somehow. And so there was a lot of fear involved in this.” [C4]
“[…][T] problem was again, it’s sort of irrational fear. They were not paying attention to the different risks between a wet and a dry patient. They heard Ebola, Ebola wet, highly contagious, everybody dies, and they wanted to be encased like a mummy. And most of them were not very receptive to dry patient, low risk.” [M25]
“ [T]here were […] physicians […] so worried about getting contaminated that they wanted three layers of PPE. And out rightly said that they would refuse to take care of anybody unless they were provided with this absurd amount of protection. Against all odds, not levels of PPE required or requested by the CDC or recommended and certainly not in, you know, we divided people into dry and wet cases.” [M25]
“[W]e decided back in the day, when you had hepatitis show up and HIV, when everybody was still panicky, and you went to the maximum and then over the years you scaled it back, we kind of decided that we didn’t want to cause any confusion because there’s already fear about the disease and things going on with the disease and so what we did is kept it at the maximum and so like we didn’t say a dry patient versus wet patient. At the time we were doing the basic training but we decided after we’d get a little bit more practice and a little bit further down the road then we can kind of look at that a little bit differently but we didn’t want to cause confusion at the beginning of the process.”[D6]
“I think they were very stressed out at first. But then when they started, so we gave them an option, like ‘how do you want to do this’, ‘what would make you feel more safe’, these are your options for PPE. and everyone chose the full PPE with the PAPR and the battery. So I think letting them choose made them a little bit more comfortable and then again the very frequent training that we do.” [D5]
“[To] allay the fears of the staff and the hospital, we said that anybody that wants to be trained could come for the training. So we had several days of people signing up for the training on how to don and doff [PPE].” [C4]
“[W]ith the Ebola scare, it’s like most of the staff, probably because of the hype there was ,and of course the seriousness of the infection, I can honestly say that most are scared to even participate.” [A1]
Comfort and Ease of Use
“And as we discovered in some of our simulations, people would overheat.” [M25]
“[S]ince it was a challenge to get the PAPRs, we were able to use these orthopedic hoods that were impervious that we put an N95 underneath. We used the hood because actually our staff

liked it better because it had a larger range or field of vision in terms of the peripheral vision and we upped the fan on it so it kept them cool." [E7]
"[W]hen we trained [a nurse] we had all the sizes, but the PPE that they had for that night [a suspect patient arrived] didn't, and he just happened to be on shift. […] He had to fit into like a skin tight PAPR and a skin tight Tyvek." [N27]
"I think a lot of our changes [in PPE] were based on staff preference. I think we realized, we're like, the covers are way too short or something, we need to get something different. I don't remember anything CDC said came out and changed anything we did." [Q31]
Training Resources
"[Y]ou know, yeahm they did definitely give ample time." [E7]
"[A]nd they were many, many barriers at multiple levels to moving all elements of that forward. Some of which we were more successful in overcoming and some of which we were manifestly not successful.[…] And lack of marching orders from senior leadership. Right, I mean [when healthcare workers won't volunteer to participate], your only response is senior leadership says you have to. But senior leadership did not say you have to and quietly whispered that they wished everything would go away. So there was really very little to leverage to make, get people to volunteer." [M25]
"[T]he nurse educators and the employee health nurse went [to the primary hospital of the network] to get trained. So they got trained down there, so we were training our staff exactly the same way that they were training theirs and then they came back and trained our staff and me as well." [B2]
EVD Education
"[O]ur administrators had some town hall meetings. I think like for about three or four weeks, I think they had one once a week, or one day a week where they would have a couple of meetings scheduled so that they could just tell people, give updates because everybody was saying well what's the latest thing, what's going on now. And we tried to keep people updated on what we learned through CDC about what countries were still at risk, who was taken off the list, that type of thing because there was all sorts of like misinformation going on." [C4]
"At the very beginning, when this was all starting, we did do some large, what you might call town hall meetings, so that everybody could understand what is this, what are we doing to prepare for it, how does it get transmitted, to kind of waylay a lot of fears and concerns and get people more on the same level of what, how serious is this and why you don't need to panic. You know those kinds of things." [D8]
"[W]e set up sessions for the information drive that's for employees, physicians, irregardless of which unit they come from, just to provide background and an update on how, what we are doing at the facility and what CDC is doing, what the CD department is doing in order to address the issue at the time." [A1]
"[T]here was a lot of education with regards to what [Ebola] was, and changing protocols that were coming. […] [W]e have a very forward focused infection control physician, […] so he was all about providing us information and education, but in a way that did not create panic and hysteria." [G11]
"We used our hospital intranet, which we were able to post a lot of information on there with resources, best practices as things were changing with the CDC. So we did do the hospital

intranet, meetings, informal meetings, email communication, a lot of meetings. (laughter)" [H13]
PPE Training
"I think it's all simulation, when I think about it. It's all hands-on, all simulation, all watched by observers, because we felt that that's what they really needed was they needed to feel it and incorporate it into their body mechanics, etcetera. Working in the suits, working in the PAPRs, etcetera." [D8]
"[W]e were using some glow germ. And so what we've done is, periodically, when we've done those quarterly dons and doffs, is that throw some glow germ in there. I myself have gone in the suit and got doused with chocolate syrup to try to say can I get out of there without contaminating myself. So those are the kind of things we've done to make sure that you grasp the concept." [D6]
"The idea was they would have to [demonstrate PPE donning and doffing] at least three times before they were considered competent. And then we were actually in the midst of discussing, 'ok, what will be our maintenance after that,' how often will we make people redo it,' and I'm not sure if that ever got completely decided." [Q31]
"[W]e had two different trainings. We had level 1 and level 2 [PPE]. […] We had the nursing administration being trained. We had heavy on the emergency room. We had environmental services, security definitely, and some of the offices. And then we opened up the level 1 training, which is basic PPE, to everybody because we said this is an opportunity where everybody should know basic PPE standard precautions and that's how we addressed it." [B2]
"Our training was focused strictly on the PPE donning and doffing, but we always did include conversation to remind them that they would not be treating the patient. That what would be reasonable for them to do would be get a set of vital signs to hand somebody a juice. The decision was that nothing invasive would be done here." [B17]
"We had competency checks for all of the nurses, all the nurses and doctors that we trained. We had a checklist and we would correct it on the spot if there was something that they breached." [C4]
"[W]e do [PPE training] every month for our team. So pretty much every month you're going through each step, and we do it very slowly. We don't rush through it. And then you're signed off by the person that's observing you. So we do use it as a competency." [D5]
"[T]hey also actually brought in […] a consultant. […] It really did help bringing this guy in. He talked people off the ledge, they were just afraid of Ebola and what was going on. […] [H]aving some firsthand experience this man was […] able to provide some education with the staff and then he did, he kicked us off, on our initial doffing and donning and how to get that done with the original classes. So that really did help having that level of support." [D6]
"[W]e developed like a check sheet with each list of step, so that as we went through it someone would call out what was to be done. We would see how the person would put it on so we did not miss not any steps, and then they had to actually sign off on the sheet." [F12]
"[W]e would spray glow gel on the outside of the PPE and then after somebody doffed we'd get the black light and try to see if they had contaminated themselves. […] [T]here was a lot of observing to see if people were doing it right and not, and the development of the buddy system and training to be a buddy, training to be the person who's donning and doffing as opposed to the one who's helping the person don and doff." [M25]

Training in EVD Patient Care
"We did a lot of simulated drills as well, in the sense that we wanted to really have our staff familiar with the environment they're working under, wearing that PPE because over time it could be you know claustrophobic in there. As well so we would do simulations of what to do in the event of a spill. We would do simulations of what to do in the event of a healthcare worker became syncable or passed out wearing the PPE. […] We stressed no sudden movement. We stressed, you know, secure handoffs of anything. […] [W]ell now here we're asking them to take slow measured steps and everything so we did a lot of drilling in that event." [E7]
"The beginning [of training] really focused on ability to get in and out of the protective garb correctly without potentially contaminating themselves and then we moved into skills. So biggest thing we had to keep reminding ourselves was really it was the donning and doffing of the protective garb that might be the newest skill. Everything else they knew how to do. […] [C]entral line care, inserting folies, starting IVs, drawing blood.... they know how to do all of that. What they didn't know is how to do that in what we affectionately called the moon suit, and particularly when you have a PAPR on and your field of vision is very different. You had to hold your head differently to be able to see what you were doing. So some of it was learning how to position a bed at the right height because the amount of mobility you have in those suits is limited and how do you adjust for providing care while inside the suit and the head gear. And so it really was practicing the skills. The other part was they're learning their new physical boundaries because of when you have on the suits it's bulkier so learning how to operate […] so you would know if you were gonna bump into something. […] [T]he other thing too that happened in training with quarantine is that participants often would have suggestions about what would work better, be it supplies, positioning, tips to give to people. So they were very active. I always think of them as active learners and trainers because of their contributions and what they had to say." [N28]
"Well we're quite expert in the care activities and the other skills being in ER, and so really it was more about how to, I guess, to think through the steps, to make sure that you didn't breach your PPE in any way, and thinking through ok, coming out of the room, trying to be efficient in your time. If you're gonna go into the room, don't try to go in and out like we frequently do now with people that are not in an infectious state, but sort of consolidate your tasks to go in so if you know you'll have to draw some blood and then you might have to start some fluids and then things like that. We try to consolidate activities like that but really as far as the care goes, there wasn't really anything that we had to do that we don't already know how to do except for like the housekeeping portion of it, like in the event we had a patient like that we knew we would have to segregate their trash and that type of stuff." [C4]
"[T]he initial training took a full eight hours just to donning and doffing PPE. the second day was then how to do clinical work in your suit, so how do you put in a central line, how do you start an IV, what do you do if the patient vomits all over the floor. Hands on with a mannequin patient care." [N26]
Simulations and Drills
"[E]very time we do a simulation we make changes. […] [D]uring the simulations we would kind of figure out, you know, what needs to be tweaked, and we found a lot of things that we […] felt were maybe a little unsafe for their staff. They were using, like, they had to wear these big heavy boots but it was hard to get the suits off with the big heavy boots on, so, like,

we kind of worked with them on ideas on you know maybe different kind of shoes for this particular transport instead of boots. So it was things like that that we worked together and kind of finally got it down to where you know it's a lot easier now and we're able to, it flows much better obviously when you practice." [D5]
"[I] like [to] surprise the staff with a [simulation]. They love it. (laughter)" [D6]
"[O]bviously [the healthcare workers] knew that it wasn't real because we were there evaluating. […] [W]e were watching them to see if they did the process correctly or if they were touching things they weren't supposed to be touching. [W]ho responded, that was a big part of it, creating an all call page of who we would want to come in, who needed to be included in the page, that kind of thing." [K20]
"[W]e drilled. We did a drill with our ED staff and it was so real we had a nurse crying. It was that real. And the staff member who was in the room panicked and tried to come out. Tried to take off his PPE and get out. It was that real. […] And even my staff members, she said it was so incredibly stressful the first drill." [N26]
"[W]e were transporting [the mock patient] and they threw up in the hallway. We figured out who would spray the bleach, who's wearing it, what security would do, stuff like that. And it was really, it was like a disaster. It was like a gong show every day." [E16]
Impacts on Future Practices
"[W]e need to be always prepared for things like Ebola. […] [T]hat was a miserable time. (laughter) […] I would have to add the city and national efforts were disappointing, and so I'm hoping for the next time that the memories will be short about what we all had to go through, and there'll be a better response with the government at the local and federal levels on what's going on. […] [S]o we started with four Ebola Treatment Centers, ended up with three, but each of us took a significantly different approach to managing the PPE and the like and I think it would've been better if we had collaborated on what would be the right PPE and standardized training and that kind of stuff so we could help each other if need be." [P30]
"It's really interesting that the people that are on the [Ebola] team will go, 'oh my gosh, I pay so much more attention now on my mask for droplets,' and I'm like yeah. I wish I could train everybody on Ebola because I think they'll maybe have a healthy respect for PPE, but no we've not had hands-on training for PPE [since the outbreak]." [D8]
"[A]ctually putting on and taking off [PPE] and demonstrating, that was not something that we did as a routine. And something that we did as one of those opportunities is we now have with hospital orientation, every new employee has to put on a gown and gloves and a mask with the face shield and take it off, demonstrate it. […] [W]e also have annual offering of training and that again is a level 1, the basic. So that's what we came walking away with out of this, that the basic training that people just don't know how to put stuff on and take it off appropriately." [B2]
v
"I haven't seen a training since, you, about six months after you said there's no more Ebola. There's just not enough time to do that and staff, we're so short staffed. to set that up I mean and take five, six ER people out, they'll go crazy." [I22]
"Well I must say that by now [Ebola is] kind of a thing of the past. Everybody knows we trained for it back in the day, but because these type of things are always changing, we are, and have, discussed creating a emerging pathogen protocol to replace the word Ebola.

Whatever it could be ,whether it's zika or if next month it's something else, some kind of international outbreak that we could use the same principles." [K20]
"[A] challenge is maintaining this kind of training when you have, I don't know, 110 plus employees. It's costly because you have to pay them to come in to train, and now I haven't heard of any more Ebola. You know, it's kind of keeping it fresh and relevant to staff and why is this important is a challenge because you struggle with having them take this seriously until the next big thing comes up and then you are rushing and scrambling to put something together again. So kind of keeping it alive and going has been a struggle because once it died down and there wasn't a lot of media exposure and the [Chief Financial Officer] was breathing down your neck about it, it just kind of tends to die down because other pressing matters take place." [K20]