Emerging Bugs; Opportunities, Lessons learned and future Action items.

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Disclosures

- Speakers bureau for GSK, Pfizer and Boston Scientific
- I am a Jayhawk: Univ of Kansas BA, MD, Int Med
- And a Longhorn UTSW Pulm/Critical Care
Questions during the session?

#EbolaCHEST
Who are we?

- Texas Health Presbyterian Dallas
  - Private, NFP, Community teaching hosp
  - Part of Texas Health Resources
  - 78 acre campus, > 1 Million sq ft of space
  - 898 bed acute care hospital
  - 3300 employees
  - > 1200 MDs on Staff
  - ER with over 80,000 visits/year
  - > 27,000 admissions/year
  - Magnet designation
  - MICU, SICU, TICU
EVD

- Formerly known as Ebola hemorrhagic fever
- Can cause disease in humans and nonhuman primates (monkeys, gorillas, and chimpanzees)
- Natural reservoir host of Ebola virus unknown
  - Presumed to be animal-borne. ? bats
- Cases to date/Mortality
  - Worldwide: 10,114/4,912 deaths
  - US: 4/1 deaths
EVD

- No established FDA-approved treatment
- Limited experience in resource-rich environments
- Presents with non-specific symptoms; DDX
  - Malaria
  - Typhoid fever
  - Cholera ...
- Previously there has been a low index of suspicion in the US, now ...
Clinical Course

- Prodromal phase – days 1-4
  - Fever, chills, myalgias, and malaise
  - Leukopenia, thrombocytopenia and elevated LFTs (AST, ALT)
- Acute phase – days 4 +
  - Severe watery diarrhea (8 + liters/day), nausea, vomiting and abdominal pain
  - Headache, chest pain, SOB, rash
  - Coagulopathy, electrolytes abnormalities, AGMA
Clinical Course

- Can progress to MSOF
  - Shock
  - Respiratory failure
  - Renal failure
  - Encephalopathy
  - Hemorrhage
Springing to action

- Ebola task force formed 9/30/14 when Dx established with key hospital personnel
- First Incident Command Center meeting 10/1/14 0700 with large group from CDC present
- Review and update policies and protocols with CDC frequently
- 10/1/14 First conference with CDC and Emory clinicians; occurred daily at 1600 for the next 19 days
Types of PPE hoods
Patient # 1
45 yo Liberian male

- 4 day hx of fever, HA, with 2 day hx of diarrhea
- On admit: temp 103, WBC ct 3.13, plts 68, AST 141, ALT 518, Cycle threshold (CT) 19
- PICC placed for access, CVP monitoring
- Developed hypoxia and azotemia
- Hypotension empirically treated with hydrocortisone
- Intubated and CVVHD (citrate) hosp day # 6
- CT → 17 → 19 → 25 → 26
- Died hosp day # 10
Patient # 2
26 yo RN

- 1 day hx of fever, chills, HA and mild sore throat
- ~11 days after care of patient # 1
- PICC placed for access and monitoring
- On admit: temp 100.8, WBC ct 4.1, plts 343, AST 63, ALT 53, CT 32
- Developed rash hosp day 2-3
- Nadir/Max: WBC 2.03, plts 63, AST 223, ALT 191
- CT → 36 → 38
- Transfer to NIH hosp day # 6
Patient # 3
29 yo RN

- 1 day hx of fever
- ~14 days after care of patient # 1
- PICC placed for access and monitoring
- On admit: temp 100.5, tachycardic to 130’s, WBC ct 2.67, plts 120, AST 255, ALT 175
- CT 30 → 33
- Transfer to Emory hosp day # 2
Management considerations

- Aggressive supportive care
  - Early central access
  - EGDT BUT attempt to avoid hypervolemia
    - ? Early colloid vs crystalloid
  - Early empiric antibiotics (no cultures)
  - Nutritional support (TPN until diarrhea resolves)
  - Lung protective strategy for ARDS
  - RRT?
Management considerations

- Special considerations
  - No cultures
  - “No” labs vs “maybe” labs
  - Limited imaging
  - How to “control” human waste
  - How to “handle” human waste
  - How to handle need for Sx
Converting a 25 bed ICU into a 3 bed Ebola isolation Unit
ICU Staffing

- 4 primary RNs to rotate in and out of the room in full suits and PAPRs (Powered Air Purifying Respirators)
  - Critically ill pts: 2 RNs in room at a time with change every 4 hours
  - Less ill pts: 1 RN in the room with more frequent changes
- 1 runner for support in the anteroom
- 1 charge RN to answer phones, communicate with team
- With > 1 pt, added 4 RNs, same runner and charge
- RT with vented pt, Pharm D
Converting an 15 bed ER area into a 7 bed Ebola isolation observation unit
Important considerations

- One way flow
- Ensure communication
- Adequate space for doffing
- “Buddy” system for donning and doffing
- Adequate space for waste
Patients Screened per CDC Algorithm

- 3 patients positive for ebola
  - All with triad of leukopenia, thrombocytopenia, elevated LFTs
  - Moved from ER to ICU
- Patients with pos history of possible exposure
  - Negative lab testing
  - Observed in the ER for 24-72 hours
  - All with neg lab triad except 1 with chronically elevated LFTs
- Over 30 screened and not tested based on CDC algorithm
  - All discharged home
ED Staffing

- 5 RNs for 1 pt
- 2 more RNs per additional pt

MD Staffing for both

- 1 Intensivist
- 2 ED MDs
- 1 Internal Medicine Hospitalist
- 1 ID MD
- 1 Renal MD
Logistics: Consumables

- Supplies *purchased* for 3 pts and multiple possible pts
  - 48,600 pairs of gloves
  - 16,000 high top shoe covers/booties
  - 12,150 sets of disposable scrubs
  - 2,880 full face shield masks
  - 2,525 jumpsuits
  - 2,300 N95 masks
  - 420 PAPR hoods
  - 31 PAPRs
Logistics: Diagnostic equipment

- Portable X-ray machine with wifi for plain films
- POC labs (I-Stat/Piccolo) with wifi for chemistries, INR, ABG ...
- Chemistries that can be run in a “closed” system
- Portable doppler/US for CV echo, FAST exam, vascular access
- CVVHD machine
- Ventilator
Logistics: Other

- THD Incident Command Center
  - Activated 9/30/14
    - 24 hrs/day x 16 days, 10 hrs/day x 5 days, remotely others
    - Took 2,707 calls not including cell calls and texts
    - Established a “resolution” hotline for comments/complaints
Logistics: other

- ICC fielded innumerable calls from people with “cures” for EVD
- 30+ News crews with satellite trucks took out our cell service so ATT placed an emergency cell tower
- Someone Tweeted the direct line to the ICU one Sunday AM, making it impossible to get through
- Death threats to our pt as well as our staff
Challenges

- International scrutiny
- Evaluating ill patients in an ED (PCP office?) who MAY have EVD is much different than caring for an EVD pt
- Communication
  - Between services (RNs, IP, MDs), Administration, ICC
  - County Health and State Health Depts, CDC
- Staffing: balance between limiting exposure and limiting burnout
Challenges

- Delivery of care in a deeply isolated patient
- Limited diagnostics: what goes in the hot zone, STAYS in the hot zone
- Waste...human/nonhuman
- Pregnancy, urgent/emergent surgery?
Psychological challenges

- Need to address mental health early
  - Patients
  - Staff
  - Family
- Need to alleviate fear of the unknown
- Need to address community fears and perceptions
Unintended consequences

- Increased staff “call ins” as time goes on
- Effects on our loved ones
  - Patients
  - Staff
- Furloughed staff
- Furloughed MDs
Mitigating Unnecessary Exposures

- Consider video evals of less ill pts
- Limit visits by the medical team
- Cross training Nurses for “extra” roles
- POC lab testing
- Solidifying liquid waste
“How to” in a Community Hospital

- Create volunteer medical team
  - Identify needed personnel and job descriptions
- Establish seamless communication capability
  - Chain of command AND chain of communication
- Institute an informational flow pathway
  - Debriefing
  - Medical team
  - Hospital officials
  - Non-hospital officials
- All needed contact info provided early to all
“How to” in a community hospital

- Role of pharmacy huge
  - Experimental therapy logistics
  - IRB, FDA, EIND...

- Clinical collaboration
  - Emory
  - CDC
  - Nebraska
  - Dallas?
“It’s what you learn after you know it all that really matters”

Favorite quote of President Harry Truman and Coach John Wooden. By American cartoonist, humorist and journalist “Kin” Hubbard 1913
Questions?
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