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

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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

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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 forced 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

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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

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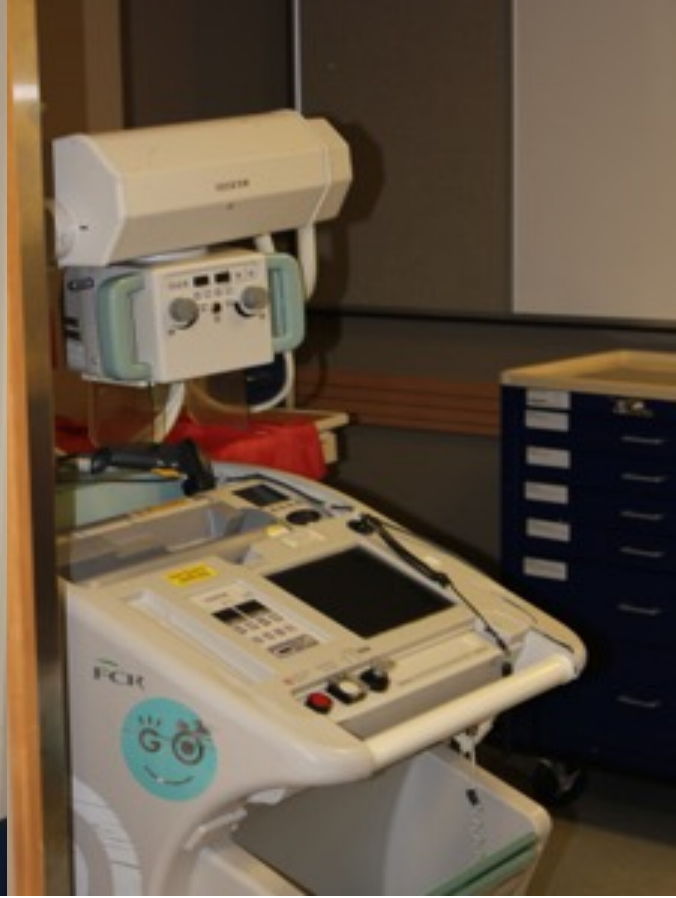

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ICU Staffing

- 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

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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

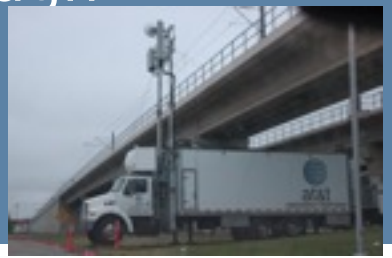
- Portable X-ray machine with wifi for plain films
- POC labs (I-Stat/Piccolo) with wifi for chemistries, INR, ABG …
- Chemistries that can be run in a "closed" system
- Portable doppler/US for CV echo, FAST exam, vascular access
- CVVHD machine
- Ventilator

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



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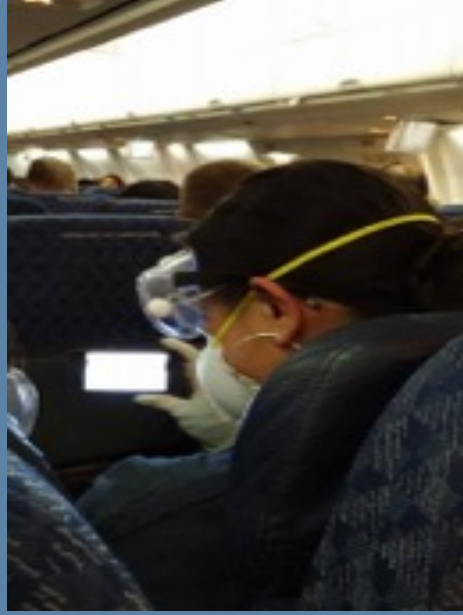
Challenges

- 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

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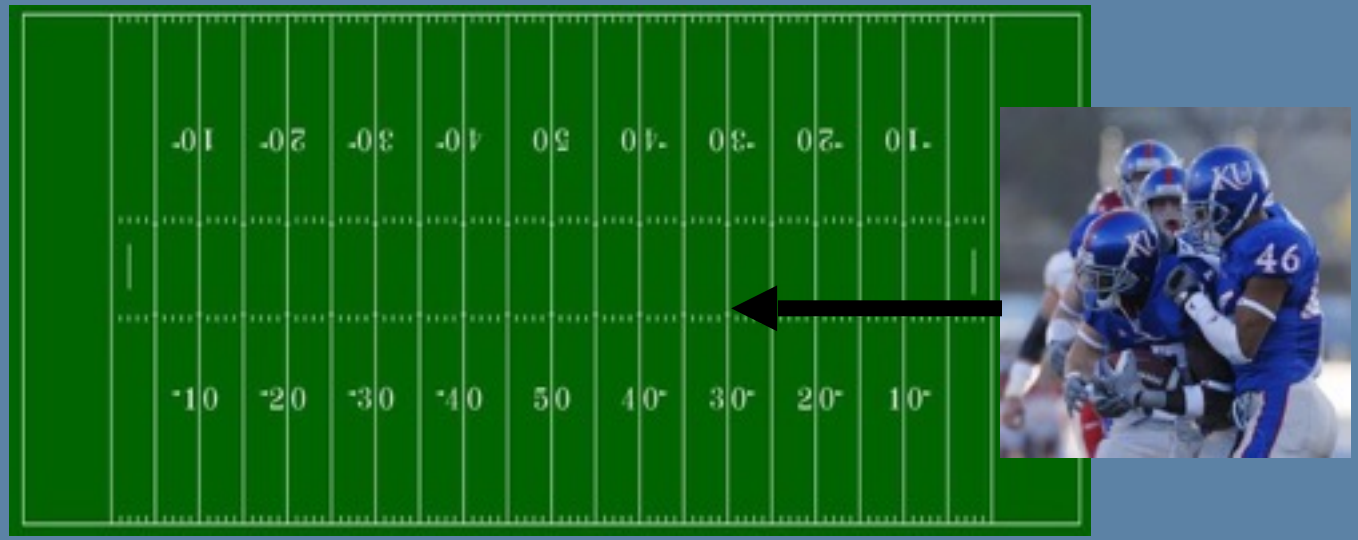

Questions?

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