Domestic Hospital Preparedness

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Disclosures: Wake AHEC requires all speakers to disclose any relevant financial conflicts of interest.

- Dr. Wolfe has no related relevant financial conflicts of interest related to this talk.
- Unrelated to this talk, DR Wolfe discloses the following:
  - NIH/NIAID funded influenza programs:
    - IRC-003, IRC-004
    - FLU-002, FLU-003, FLU-004, FLU-IVIG
  - Private funding:
    - Data Safety Monitoring Board (DSMB) Chairman
      - IV Zanamivir studies, GSK
    - Internal Safety Review Committee (iSRC) member
      - Danirixin studies, GSK
  - Duke Vaccine Trials Evaluation Unit, DSMB member H7N9 vaccine trials

- Other funding:
  - Cellerant, Ansun, Gilead, Merck, Chimerix, Astellas

Ebola Planning Timeline

- May 2014: Duke Preparedness Response Center agenda item – risk asx, management

- June: First Duke Hospital I/C meeting
- July: Drill between Duke Hospital, Urgent Care, Durham County EMS

- August: WHO - "public health emergency" - *Emory Cases 1 & 2
- August: First training of staff with BSL3 lab / safety teams
- August: Duke University implements travel ban

- September: First clinical mx team drilled, network hospital plans unified
- September: Health system wide taskforce engaged
- September: Joint international research project Duke-UNC *Dallas Case

- October / November: team expanded up to almost 40 members
- Simulation center drills begin occurring on refurbished "isolation ward"

- November 2nd – sitting on a beach in the Carribbean, Megan Davis calls my phone…

1st activation of Isolation Suite

- November 2nd am, Pt X reports fever to local HD → State
- (d3 post departure Liberia -> NYC -> NC)

- November 2nd pm, Pt transported to Duke
  - First Ebola PCR drawn (-ve that pm)

- November 3-5th, patient remains on ward
- November 5th am:
  - Second Ebola PCR drawn, neg test by 5pm, patient discharged back to County HD active surveillance.

Clinical Treatments & Team Players:

- Strict isolation, No proven drugs
- Significant electrolyte, fluid replacement
- Blood product support
- Rigid infection control, waste mx

Changing worldwide standard regarding:

- ? Renal replacement
- ? Intubation / CPR
- ? Restrictions on care
- Unprecedented HCW risk

- Many calls between Emory / Nebraska!

- ICU-level RN's ideal
- Blood Bank, Laboratory staff
- Anaesthesia capacity
- Dialysis teams
- Respiratory therapy
- MICU / Infectious Disease Physician teams
- Nephrology
- Ethics, Pediatrics, Obstetrics

Experimental Treatments

- Zmapp, Brincidofovir (CMX001), TKM-Ebola, Favipiravir
- Convalescent Plasma
  - How do we call Kent Brantley?
- FDA , CDC , IRB channels opened in advance

Media and Communications

- University , Hospital joint messaging
  - Staff first, patients and students second
  - Get the patient moved, *then* tell the media
- During activation, joint media conferences with DCHD, NC-DHHS

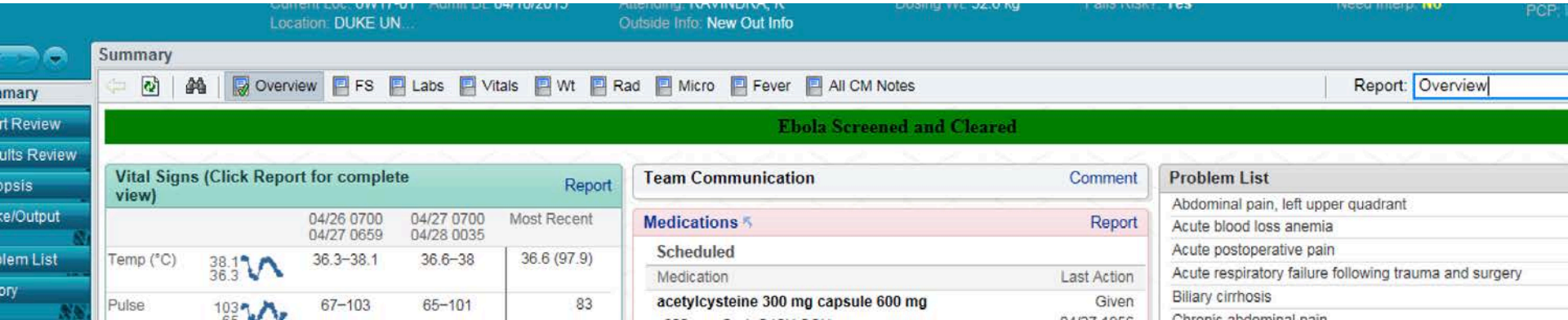
3 questions – EPIC front page:

- (1) Have you travelled outside the US in the last 21 days ?
  - No? Questions end.
  - Yes? Continue:

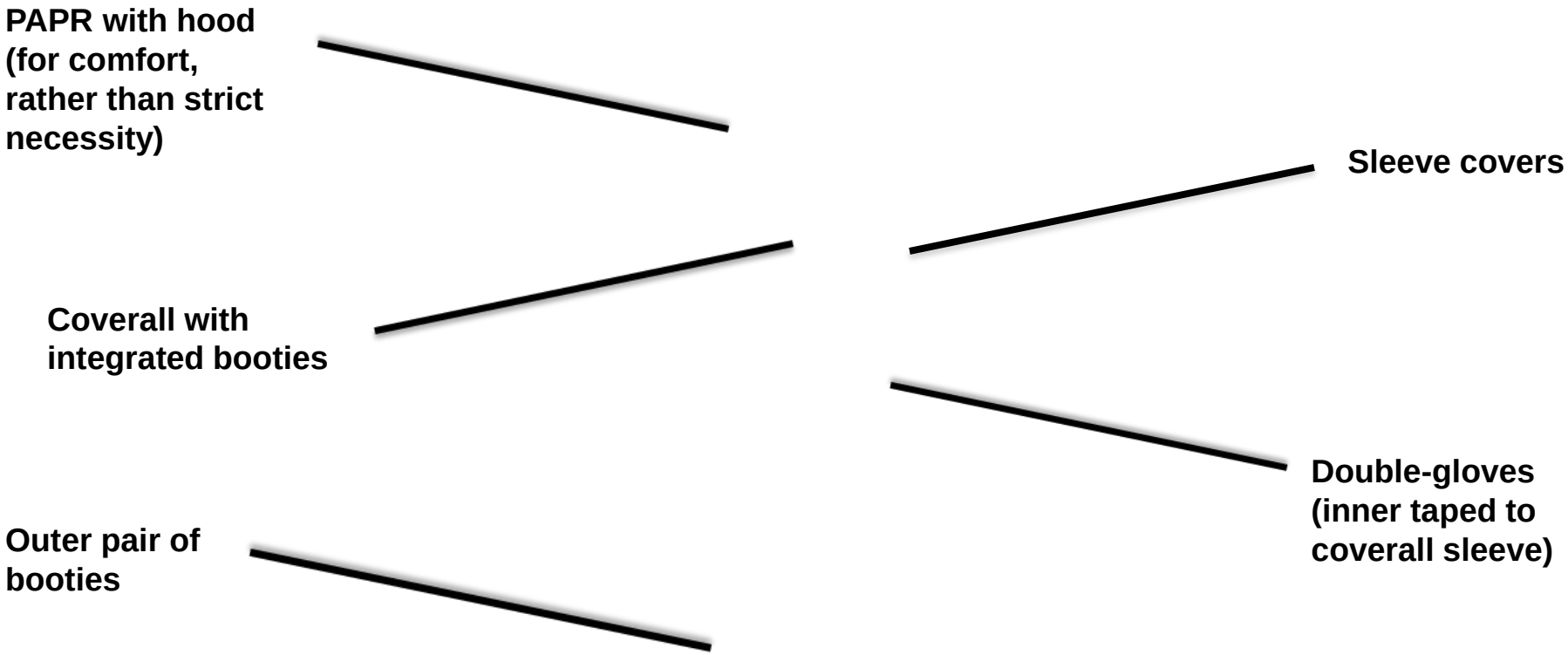
- (2) Have you specifically travelled to Guinea, Liberia, Sierra Leone?
  - No? Questions end.
  - Yes? Continue:

- (3) Do you have any symptoms? If so what?

- Answer 3x YES, and you NEED TO BE RULED OUT * -→ isolate & call



PPE required for containment unit room entry



Duke Experience:

Special Pathogen Unit

Simulation Lab

- Collaboration with Duke University Human Simulation and Patient Safety Center
- Training for patient transport
- Training for activating Special Pathogen Ward, donning / doffing

Practice the management of:

- Dropped sample
- Ripped glove
- Respiratory Distress / Emergency Airway
- Vascular Access
- Patient Delirium / Combativeness
- Extreme hypotension
- CXR
- U/S
- Lab specimen handling
- Trash/Linen handling

Care Team Identification:

- Medical and Nursing Lead identified first
- Remainder team built around
  - A) type of patient – rule-out vs positive
  - B) severity of illness of patient – wet vs dry; stable vs unstable
  - C) patient demographic – child, pregnant, family
  - D) other resources already utilized – eg; second patient

- Engage Employee Health, Enviro-Safety, BSL-3 staff
- EOC activated
- Communications team activated

- Activation of staff accommodation facility*
- Initiate staff backfill plan

Additional planning:

- Waste Management
  - On ward autoclave fully operational
  - Split service between autoclav and stericycle class A waste use
  - All staff trained and Simulator trained on appropriate waste Mx
  - OESO staff and MD leads trained on autoclav use
  - Dedicated protocols for toilet / drain waste
- Decontamination
  - All rooms H2O2 ready and tested (walls, roof modified)
  - All active patient care areas Simulator trained for staff cleaning
  - Ambulance, trolley, wheelchair etc
- Future locations
  - Unlikely to keep full ward out of commission as outbreak ends
  - Balancing two ID risk extremes: Ebola (contact) with SARS (inhaled) and you will have your perfect location.

Lessons learnt:

- Major planning initiatives all worked.
- Substantial communications, logistics and clinical operation. Prior simulation patient crucial.
- Having ways to back up your staff, crucial.
- Substantial unfunded cost
- Waste management consumes majority time
- Controlling public message key
- Procurement of PPE remains difficult
    - Staffing roster different for every major hospital who has tried (MD, RN, RT's etc)

So- What "Pandemonium" virus is next?

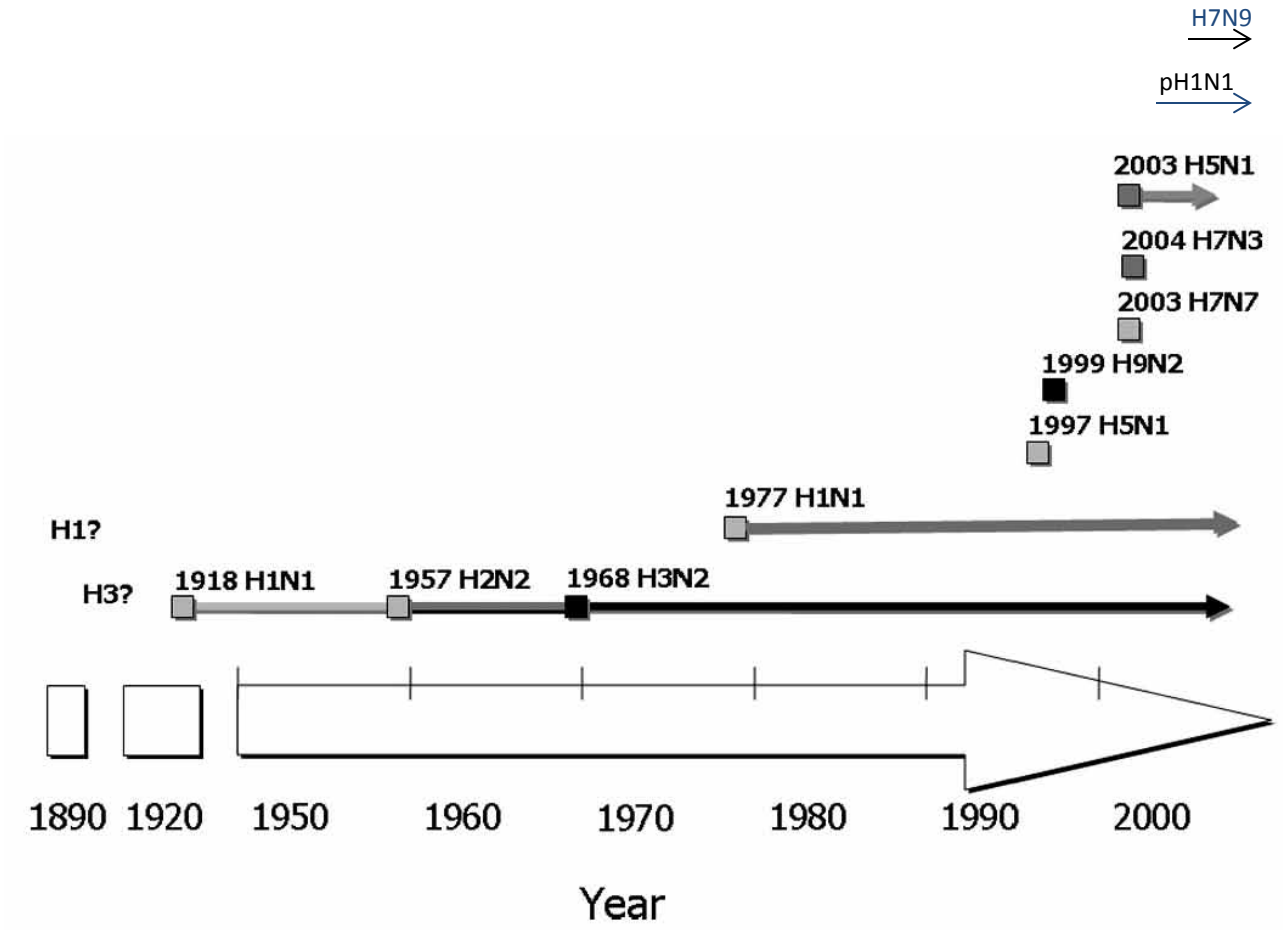


FIGURE 2. Timeline of pandemic influenza. In the 20th century, humans have experienced 3 influenza pandemics: the 1918 H1N1 "Spanish flu," 1957 H2N2 "Asian flu" and 1968 H3N2 "Hong Kong flu." Pandemic influenza occurs when a

Not every hospital *wants* to be Nebraska or Emory

- Opinions pre / post Dallas changed. Different now
- Who pays to build it?
- Who pays to keep it operational?
- Who delivers the care? (and who backfills?)
- What do you do with the facility when there's not an outbreak?
- Is it a public or private asset?