Health and Safety Issues During a *Salmonella enterica* Serotype Newport Outbreak at a Large Animal Teaching Hospital

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Thomas Boyle
University of Pennsylvania

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“Our primary obligation right now is to ensure the safety of our staff at New Bolton Center and to make the Hospital safe again for patients.”

Alan M. Kelly
Dean, School of Veterinary Medicine
Clinic Risk Zones

5/21/04 - Treadmill moved to low-risk zone
George D. Widener Large Animal Hospital

- One of the busiest large animal hospital’s in the United States.
- Approximately 6,000 in-patient visits and 19,000 field service patient visits annually.
- Admits a large number of critically ill and emergency cases (~1,200 annually).
- One of the few facilities in the Mid-Atlantic region that provides 24/7 coverage for serious large animal health emergencies.
Time Line Leading Up to Closure

► July 1, 2003 – Index Patient - - three year old thoroughbred race horse was admitted to the hospital as a colic emergency.

► March, 2004 – a possible *Salmonella* outbreak was detected. Environmental surveillance increased and efforts were made to clean and decontaminate high-risk areas while maintaining essential hospital services.

► April, 2004 – the hospital was closed to elective in-patient cases; only emergencies were admitted.

► The Dean closed the hospital on May 10, 2004.
Steps to Correct the Problem

- Director of Biosecurity was appointed.
- Decontamination efforts would be handled under the Incident Command Structure.
- All animal housing and clinical spaces and the paths connecting them would be subject to rigorous, multistage cleaning and disinfection.
Major Points

► Communication, Communication, Communication
  ▪ Daily morning meetings of working group
  ▪ Daily afternoon meetings of working group
  ▪ Weekly meetings with entire clean-up team

► Training, Training, Training
  ▪ Prior to initiation of “The Great Scrub”
  ▪ Prior to initiation of a new stage

► Reinforcement
Prep Work

► Many animal housing areas were sandblasted and resurfaced.
► Equipment and supplies in ALL areas were cleaned or discarded.
► Major upgrades to facilities.
  ▪ Some flooring bases were completely removed and replaced with concrete plus a polyurethane based monolithic flooring system.
  ▪ Drain lines.
  ▪ Re-grading and new pathways between buildings.
Multi-Stage Cleaning and Disinfection

► Stage 1: Plain anionic detergent applied with a small brush to ensure that all surfaces from the ceiling to the floor were disrupted (A125 Liquid). 15 minute contact time and rinsed.

► Stage 2: Diluted bleach was applied. It was rinsed after 20 minutes – numerous times. This step was only used on non-porous surfaces.

► Stage 3: Application of quaternary ammonium. After 5 hours or overnight, this was rinsed.

► Stage 4: The final disinfectant phase involved fogging the area with a 4% solution of Virkon-S.
Health and Safety Related Issues

- Hazard Communication
  - Numerous disinfectants
  - *Salmonella*

- Temperature
  - Heat Related issues
  - Sunburn

- PPE
  - Gloves
    - Nitrile
    - Overgloves
  - Eye Protection
    - Goggles
    - Face shields
  - Tyvek suits
  - Dedicated footwear
    - Plastic boots
    - Overboots
  - Hearing Protection
Health and Safety Related Issues

- Working at heights
  - Ladders
  - Scaffold
  - Scissor lifts
- Gas powered foggers
- First Aid/Emergency Response
Hazard Communication

- *Salmonella* fact sheets were distributed to all New Bolton Center employees via e-mail. Hard copies were also made available at the sign in table and posted on a central board.

- A multi-drug resistant *Salmonella enterica* serovar Newport Information Sheet was distributed to all New Bolton Center employees via e-mail. Hard copies were also made available at the sign in table and posted on a central board.

- MSDS sheets for all disinfectants were distributed to all New Bolton Center employees via e-mail. Hard copies were also made available at the sign in table and posted on a central board.

- Standard Operating Procedures (for all tasks) were distributed to all New Bolton Center employees via e-mail. Hard copies were also made available at the sign in table and posted on a central board.
Temperature Related
PPE

- A125, Clorox Bleach, and Quatricide
  - Coveralls
  - Rubber boots
  - Scrub hat
  - Reusable safety goggles
  - Disposable face shield
  - Disposable nitrile gloves
  - Reusable over gloves (optional)
PPE

- Virkon-S Fogging
  - Coveralls (rain slicker on top)
  - Rubber boots
  - Disposable nitrile gloves with overgloves
  - Carbon monoxide monitor (one person)
  - PAPR
  - SOLO 450
  - Hearing Protection
Working at heights
Gas powered foggers
First Aid/Emergency Response

- Portable emergency eyewash available (filled every morning)
- Portable emergency shower (similar to what is used on asbestos jobs)
- SOP drafted
- Contacted the local fire, EMS, and HazMat (provided them a pamphlet with SOP, MSDS sheets, emergency contact numbers, etc.)
Conclusion

After 85 days, the hospital began accepting patients again and an economic analysis of the response was initiated.
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Further Reading

Questions