Traditional Approach to Animal Disease Eradication

• Surveillance
  - Detection of infected population
  - Enhanced targeted testing of Risk Population
  - Traces of contacts
Traditional Approach to Animal Disease Eradication

- Elimination of Foci of Infection
  - Euthanasia of infected/exposed animals and disposal
  - Cleaning and disinfection

Traditional Approach to Animal Disease Eradication

- Biosecurity Enhancement
  - Quarantine
  - Movement Controls
  - Pre-movement Testing
  - On Farm and Vehicle Biosecurity
2006 – 2007 EHV-1 Outbreak - Florida

- December 11\textsuperscript{th} – Suspect EHV-1 Reported to State by Veterinarian
- December 12\textsuperscript{th} – December 20\textsuperscript{th}
  - Disease investigation
  - Trace-out of exposed
  - Placement of quarantine
- December 21\textsuperscript{st} – Incident Command Post Established
  - Trace out and quarantine
  - Daily monitoring of quarantined facilities
  - Intensive education/outbreak
  - Protocols – biosecurity, testing, quarantine release
  - Modification of quarantine
  - Quarantine release
- January 18\textsuperscript{th} – Closedown of Incident Command Post
- January 20\textsuperscript{th} – Last Quarantine Released

Over 4,000 hours worked by state employees
Incident - Wellington EHV-1 Incident  December 21, 2006 – January 20, 2007

Objectives:

A. Control / minimize the spread of Equine Herpesvirus Type 1 (EHV-1) in Florida
   1) Continue to identify exposed and infected horses
   2) Isolation and treatment of infected animals
   3) Quarantine and monitor affected premises

B. Enlist cooperation of horse owners, veterinarians, and industry representatives to collect samples, analyze data, generate epi curves, and disseminate accurate information.

C. As in any incident response, priority will be given to the safety of responders and the public.

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**EHV1: Clinical Disease and Virus Excretion from Respiratory Tract**

**Mild Respiratory Disease May Occur**

**Incubation**

**Neurological Disease**

- Nasal Virus Excretion (Red)
- Temperature (Blue)
- Viremia (Green)

*Provided by:*
Dr. Paul Gibbs
College of Veterinary Medicine
University of Florida
Jan 16th – Jan 18th

Testing of 218 horses in the barns and two isolation tents was monitored on 01/16
EQUINE HERPES OUTBREAK

ORIGIN LOAD
MD – 1 NY – 3 NYAIC – 5

Clinic 1
Clinic 2
Mobile Vet

Premise A
Premise B
Premise V-1

Premise E
Premise C
Track Barn Z

Track Barn X
Barns 3a,4a,5a
Remaining 18 Barns

Premise V-2
Premise D
Horse Van Co.

Premise F
Export Barn

Track Barn Y
Anthony

Spar

Legend
Origin  Mandatory  Voluntary  Vet  Transport  Relationship
Proximity  Human Traffic  Equine Traffic  Clinical to Human Contact  Equine Contact

EHV-1 Outbreak Response

Activities of Incident Command Post

- Tracing of Exposed Horses
- Quarantine of Positive Premises
- Protocol Development
- Daily Monitoring of Quarantined Facilities
- Modification of Quarantines
- Industry Liaison/Outreach
- Public Information – Web Site, Media

Over 4,000 hours worked in this ICP Response
Release from EHV-1 Florida State Quarantine requires:

- **Clinical Signs**
  - Absence of clinical signs for 21 days
  - Low grade fevers in a quarantined facility must have nasal swab and whole blood collected for PCR testing. If tests are negative and no other clinical signs are noted, the Department of Agriculture and Consumer Services veterinarian may determine that the fever was not due to EHV-1 exposure/infection and therefore the quarantine “clock” may not need to be reset.
  - Residual neurological signs or neurological signs that have stabilized with no significant changes noted after a 3-day period will start clock for quarantine countdown.

Using the above criteria the Department representative will establish a Day 0 for each quarantined premises. This date will determine the first date for final testing of horses to release quarantine.

- **Testing**
  - See protocol for sample collection. Testing for release of quarantine must be observed by a state representative.

- **Negative Test Results**
  - Negative PCR testing 18-21 days post clinical signs by recognized laboratory of all horses under quarantine (no new clinical signs in any horses in the quarantine)

- **Positive Test Results**
  - Any horses with positive test results of quarantine release testing must be segregated and isolated from other horses.
  - If a positive test horse(s) is a residual positive (previously positive) then retesting all quarantined horses for release can be done no less than 10 days from the previous release test date.
  - If a positive test horse is a new test positive case, this is indicative of disease transmission; therefore, retesting all quarantined horses can be done in no less than 14 days from the previous release test date.
  - Any positive samples tested for quarantine release must be further tested by an approved laboratory to characterize presence of neuropathogenic strain. Non-neuropathogenic strains will not be considered positive.

- **Suspect Test Results**
  - Any suspect test results will require retesting of suspect horse(s).
The Incident: Equine Mortality

- Sunday, April 19, 2009, late afternoon
  
  - Acute presentation of clinical signs, collapse, and death in polo horses just prior to match
  
  - Veterinarians and others at the scene provided various emergency measures but were unsuccessful
  
  - 21 horses showed clinical signs and 20 died within 2 hours of onset, 1 later that night
Immediate State Actions

- Department veterinarians assisted in reporting incident and coordinating sample collection and transport for necropsy
- Arrangements made to accept horses at laboratory (6 to state lab, 15 to UF CVM)
- Same day visit to origin stables
  - only horses intended for match play affected
  - limited history on horses and onset of signs collected
Complicating Factors for Response

- Sunday afternoon, evening
- Very public event – public concern
- Foreign team/ownership, various responsible parties
- Valuable animals, sudden onset
- Natural, accidental, intentional?
- Many involved, varied emergency treatments
- Inconsistent reporting: history, signs, treatments
- Identification of samples, horses
- Insurance issues
- Legal, criminal investigation
- Confidentiality
**Diagnosis**

- Acute nature indicated toxicity or allergic reaction
- Dr. Belainesh Desta, KDL state laboratory, suspected selenium toxicity based on prior experience
- Previous case involved death of 15 calves following numerous multivitamin injections causing selenium toxicity
- Clinical signs, gross pathology consistent with acute selenium toxicity
- News reports of a “Biodyl”-like vitamin mineral supplement administered at stables just prior to loading
- Compounding company admits to mixing and compounding error

**Selenium**

- Essential Trace Mineral

- Used in the body for:
  - Normal immune function
  - Normal liver, heart, and nervous system function
  - Normal reproductive function
<table>
<thead>
<tr>
<th>Clinical Signs (Polo Ponies, 2009, FL)</th>
<th>Clinical Signs (Veterinary Toxicology, 2007 Ed., R.C. Gupta, J. Hall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt;2 hours)</td>
<td>(10-12 hours)</td>
</tr>
<tr>
<td>Agitation, disorientation</td>
<td>Restlessness</td>
</tr>
<tr>
<td>Blind staggers</td>
<td>Gait problems, blind staggers</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Fever, sweating</td>
<td>Fever, sweating</td>
</tr>
<tr>
<td>Respiratory distress</td>
<td>Respiratory distress</td>
</tr>
<tr>
<td>Recumbency</td>
<td></td>
</tr>
<tr>
<td>Comatose, death</td>
<td>Death</td>
</tr>
</tbody>
</table>

**Laboratory Findings**

Pathology - edema, hemorrhage
- acute ischemic myocardial necrosis
- microangiopathy: heart, skeletal, muscle, diaphragm

Enhancement Drug Testing - Unremarkable
Hematology, ClinPath, Virology, Bacti - Unremarkable
Toxicology - Only Selenium Significant
Significant Laboratory Findings (Selenium Toxicosis)

- KDL findings were supported by other labs, including:
  - The University of Florida
  - University of California at Davis
  - Cornell University

- High selenium levels in tissue, blood and urine
- Negative findings for many other potential toxins (GC/MS organic compounds screen, ionophores, alkaloids, heavy metals, drug screen)
Status of Civil/Criminal Investigation

- Compounding company admitted incorrect dosage of selenium
- Investigating agencies – FDA, DOH, FDACS, Board of Veterinary Medicine
- Civil, criminal investigations ongoing

Summary of Events/Findings

Twenty-one polo ponies died within a few hours of receiving a compounded “vitamin mineral mix” intravenously prior to competition.

Numerous factors contributed to the difficulty of determining the cause of these deaths.

Tissue selenium findings, clinical signs, pathology, and unremarkable other findings substantiate acute selenium toxicity as the cause of death in these animals.
Equine Piroplasmosis Outbreak – Florida 2008

August 11, 2008  Racing QH presented to veterinary hospital
Slides sent to UF – Dr. Harvey

August 13, 2008  Dr. Clark reported suspected EP index premises quarantined, horse isolated

August 14, 2008  Investigation to clinic, index premises

August 15 – present:
• Trace-ins and trace-outs, adjacents
• Quarantine and testing of all suspect/exposed horses
• Tick surveillance – drags, tick traps, live animal trapping
• Mechanical transmission
• Trace-back to chronic carrier horses imported from Mexico
• Permanent quarantine/euthanasia of positives

Positive Premises Data

<table>
<thead>
<tr>
<th>Premises #1 Manatee</th>
<th>Premises #2 DeSoto</th>
<th>Premises #3 Polk</th>
<th>Premises #4 Polk</th>
<th>Premises #5 Lake</th>
<th>Premises #6 Dade</th>
<th>Premises #7 Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Positive Horses</td>
<td>5</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td># of Horses on Premises Initially</td>
<td>25</td>
<td>31</td>
<td>28</td>
<td>17</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td># of Positive Horses currently on Premises</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td># of Horses currently on Premises</td>
<td>21</td>
<td>29</td>
<td>27</td>
<td>13</td>
<td>7</td>
<td>12</td>
</tr>
</tbody>
</table>

Quarantine Data

- Number of Quarantines Placed Throughout: 25
- Number of Premises Currently Under Quarantine: 6
- Number of Positive Premises Throughout: 7
- Number of Premises Currently Having Positive Horses: 1
Evidence of Iatrogenic Transmission

• Non-Sanctioned Quarter Horse Racing
  – “Bush Track”
  – All positive horse were involved in racing during transmission
  – Non racing broodmares, ponies, foals; all tested negative
  – Ticks were only found on negative population
• Dentist
  – One needle, one syringe, one bottle of sedative; MANY HORSES
• Joint Specialist
  – Non-licensed foreign veterinarian frequented racing events
• No regular veterinarian
  – Managers and trainers medicate horses regularly
  – Shared needles frequently used; Anabolics, NSAIDS, Lasix
• Illicit Drug Use and Other Risky Behaviors
  – “Blood Packing”
  – Red Bull IV pre-racing
  – Raw cocaine + 100ml whole blood pre-racing

Mexico Connections

• 6 horses with trace to Mexico; to single premises
  – 4 have moved to other premises since 2006
    • Transmission has occurred at these premises
  – 4 tested positive during investigation
    • At least 2 entered on Negative CF via Laredo
    • 2 negative CF in 2008; cELISA positive (1 via Laredo)
  – 1 tested negative during investigation
  – 1 still pending
• Numerous verbal confirmations
  – Horses traveling in and out of Mexico without International Certificate or Quarantine
Texas Equine Piroplasmosis

October 2009 – Index case - Quarter horse
Confirmed acute clinical case on south Texas ranch

Testing of ranch horses: 292+/360

Tick survey – *Amblyomma cajennense*  
*Dermacentor variabilis*

Trace-outs (1998 – 2009)  
96 to Texas premises  
81 to 20 other states  
41 to other countries  
73+ in 15 states
Notice of Equine Piroplasmosis Endemic Areas

Effective January 20, 2012

The Florida State Veterinarian has revised the area determined to be endemic for Equine Piroplasmosis (EP) from the entire State of Texas to the following counties in the State of Texas: Bee, Bexar, Brooks, Cameron, Duval, Frio, Hidalgo, Jim Wells, Kenedy, Kleberg, Lampasas, Live Oak, Nueces, Refugio, San Patricio, Starr, Webb, Willacy, and Zapata.

Horses originating from these counties in Texas must comply with additional EP import requirements as described in F.A.C 5C 3.003

Requirements:

Official Certificate of Veterinary Inspection (OCVI). Issued within 14 days

“All animals identified on this certificate have not been on a premises found positive for Theileria equi or under quarantine within the past 30 days, have been inspected and found free of ticks, and have been thoroughly treated with an approved acaricide labeled for use in equine within 14 days of entry.”

Negative CELISA test for both Babesia caballi and Theileria equi (Babesia equi) performed within 30 days