



EQUINE DISEASE QUARTERLY

FUNDED BY UNDERWRITERS AT LLOYD'S, LONDON

APRIL 2018

Volume 27, Number 2



COMMENTARY

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University of
Kentucky
College of Agriculture,
Food and Environment
Department of
Veterinary Science

LLOYD'S

This is a clarion call for every equine owner, manager, caretaker, veterinarian/scientist, or other equine stakeholder with the desire to maintain and improve the welfare of the horse and the quality of life of the equine industry stakeholders before, during, and after disaster events. Water, food, fuel, shelter, medical care—how will you access these vital needs for survival for you, your horse(s), and other family/team members, pets, and livestock if faced with a disaster event like those that affected millions last year along our coasts, in our heartland, and in cities, towns, and villages all over the U.S. and in other countries? What is your plan when water is rising or fire is racing so fast around your farm or stable that you cannot get your horses out? What is your plan if you and your horses are involved in a vehicular accident during transport or if you are required to “stop-movement” due to a disease outbreak? With the multitude of maladies that can and will occur to us and our animals in our lifetime, can you answer “yes” to the question, “Have we done ‘due diligence’ with developing a functional all-hazards disaster plan to protect us and the animals that make up such a significant part of our lives?” In an age of increasing exposure to extreme weather events exacerbated by climate change along with human and animal population expansion, it is not a matter of if, but when will it happen to each and every one of us in some capacity. It is time for us as equine stakeholders to wake up and heed the call over 13 years (or longer) in the making, to take responsibility for our own lives and the horses that mean so much to us, our families, our economy, our country, and our world.

Since 2005, post-hurricanes Katrina and Rita, animal issues have become a real part of the discussion regarding emergency planning in communities, especially pet animals since saving animal lives

saves human lives. People are more apt to evacuate out of harm's way if there are provisions for the animals. Many areas of our country have made major progress and have made it a priority and routine to be proactive with planning in areas prone to repeated disasters (e.g. coastal Florida, parts of Louisiana and Mississippi, Texas, California, and others). However, it is clear that complacency and lack of situational awareness related to individual risk still seems to be the norm at the local community level. Although there are numerous stories of heroes, lives saved, positive outcomes in recent and past disasters, the losses continue to mount. Many of these losses are repeats of the same mistakes happening again and again. Will it really take a disaster such as Katrina, Sandy, Harvey, Maria, or major wildfire for folks to realize that responsible horse owners must have a functional disaster plan? Let's take 2017 as the real wake-up call and apply our passion for these majestic animals to make 2018 and our future stronger, brighter, and better for the horse and the people who share this common bond. Let's make coordinated, concerted efforts in our own communities to strengthen our home, farm, ranch, business, and community disaster plans.

Take the time to familiarize yourself with the numerous resources that are available to assist with local community disaster planning. The AVMA, AAEP, and State Ag Extension Services, and community response teams are good places to start.

<https://aaep.org/horsehealth/disaster-planning-horse-farms>
<https://ebusiness.avma.org/>
<https://training.fema.gov/emiweb/downloads/is10comp.pdf>

CONTACT:

Rebecca McConnico, DVM, PhD, Dipl ACVIM (LA)
rmconn@latech.edu
(318) 257-2418
Louisiana Tech University
Ruston, Louisiana



INTERNATIONAL

Fourth Quarter, 2017

The International Collating Centre, Newmarket, United Kingdom, and other sources reported the following equine disease outbreaks. Isolated cases of African horse sickness (AHS) were recorded in South Africa. The disease was confirmed in the Eastern Cape, Free State and Gauteng Provinces, all within the AHS infected area of the country. Turkey confirmed one case of glanders during routine screening.

The USA reported nine outbreaks of equine influenza involving four states with multiple cases in Texas. One outbreak was also confirmed in the UK. France, Germany, South Africa, Switzerland, the UK, and the USA recorded outbreaks of strangles. The number of confirmed disease events ranged from 11 in France, three in Germany, sporadic occurrence in South Africa, three in Switzerland, endemic in the UK, and the USA with outbreaks reported in 12 states. Equine herpesvirus 1 (EHV-1) related diseases were reported by France, Germany, Ireland, Japan, South Africa, and the USA. EHV-1 respiratory disease was recorded in Ireland (five cases), Japan (one outbreak), South Africa (two cases), and the USA (widespread in various states). Abortion was confirmed by France (two cases), Germany (two cases), Japan (single cases on five premises), and the USA (two cases). EHV-1 neurological disease was diagnosed in France (three outbreaks, each involving a single case of the disease), Germany (one case), and the USA (single outbreaks in seven states; seven cases in one outbreak associated with a G2254 strain of the virus). France (18 outbreaks), Switzerland (one case), and the UK (three outbreaks) reported respiratory illness associated with equine herpesvirus 4 infection. The USA diagnosed a single case of abortion.

Equine herpesvirus 2 and/or 5 infection was recorded in several states in the USA, sometimes associated with evidence of respiratory disease.

Canada (four cases in Alberta and one in Quebec), France (single case), and the USA (one case in Tennessee, two in Kansas, and multiple cases in Montana), confirmed occurrences of equine infectious anemia in the fourth quarter of 2017. Equine piroplasmiasis was reported to be endemic in France and in South Africa, with 27 cases diagnosed in six of the nine provinces. France, Germany, and South Korea recorded cases of contagious equine metritis. A yearling filly without any breeding history was found positive on a pre-export test in France. Two cases were diagnosed in Germany, and South Korea detected 22 positives among 2,165 samples tested without specifying in which quarter they were identified. Eight cases of leptospiral abortion were diagnosed in Kentucky, USA. The USA reported 10 cases of serogroup B *Salmonellae* in Kentucky. One case of equine neorickettsiosis was recorded in Washington State, USA.

Rotaviral enteritis was confirmed in Argentina (two outbreaks in 2-month-old Thoroughbred foals on separate premises) and France (a single case).

The USA reported cases of proliferative enteropathy caused by *Lawsonia intracellularis* in Kentucky (10 cases) and Pennsylvania (one case).

Clostridial enteritis/enterocolitis due to *Clostridium perfringens* Type C toxin was linked to six cases of disease in Kentucky. The USA confirmed 30 cases of Eastern equine encephalomyelitis in the fourth quarter of 2017, 12 of which were diagnosed in Wisconsin.

103 cases of West Nile encephalitis were reported across numerous states in the USA, with New York and Utah each responsible for 26 cases. Rhodococcal-related disease is endemic in the USA, with eight cases confirmed during the review period. Infection with *Corynebacterium pseudotuberculosis*, the cause of Pigeon Fever is endemic in the USA; a single case was diagnosed in Washington State.

Cutaneous Lymphangitis

The lymphatic system is an important component of the cardiovascular system and consists of lymphatic vessels, lymph nodes, tonsils, spleen, and thymus. Lymph, which is a clear colorless fluid, is formed from fluid loss that occurs during

normal nutrient exchange in capillary beds. Lymph is transported by lymphatic vessels to regional lymph nodes for filtration to aid in immunologic detection of microorganisms, toxins, and foreign material. Once filtered, the lymph is again trans-



Equine Disease Quarterly

Editors

Peter Timoney
Alan Loynachan
Cynthia Gaskill

Staff

Diane Furry
Tawana Brown
Dennis Duroso

Correspondence should be addressed to the editors, Department of Veterinary Science, Maxwell H. Gluck Equine Research Center, University of Kentucky, Lexington, Kentucky USA, 40546-0099
Telephone (859) 257-4757
Fax (859) 257-8542

Internet address:
<http://gluck.ca.uky.edu/equine-disease-quarterly>

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ported by lymphatic vessels to large veins, which ultimately return it back into the circulatory system to replenish the fluid lost from the capillaries. Lymphatic disease can occur when lymph vessels become inflamed, leaky, and/or blocked.

Cutaneous lymphangitis—inflammation of lymphatic vessels of the skin—is fairly uncommon in horses, does not exhibit age, sex, or breed predilections, and can develop from both infectious and non-infectious causes. Clinically, cutaneous lymphangitis can manifest as a swollen limb, skin abnormalities characterized as multiple skin nodules that can abscess or develop draining tracts, and/or lameness. Cutaneous lymphangitis typically affects the distal portion of a single hind limb, between the hock and hoof. Due to the characteristic appearance of affected limbs, the disease is commonly referred to as “big leg” or “fat leg.”

Infectious cutaneous lymphangitis has traditionally been associated with poor hygiene and insect transmission of microorganisms. It is sporadically diagnosed in horses, but sometimes occurs simultaneously in multiple horses on the same farm. Infection of the lymphatic system develops following contamination of skin wounds by various bacteria, most commonly *Corynebacterium pseudotuberculosis* (the causative agent of ulcerative lymphangitis/pigeon fever). However, pure or mixed infections with other bacteria, such as *Staphylococcus* sp., *Streptococcus* sp., *Trueperella pyogenes*, *Rhodococcus equi*, *Pasteurella haemolytica*, *Pseudomonas aeruginosa*, *Fusobacterium necrophorum*, *Actinobacillus equuli*, and *Burkholderia mallei* (the cause of glanders) can also result in cutaneous lymphangitis. Additionally, pathogenic fungi such as *Sporothrix* sp. (the cause of sporothricosis) or *Histoplasma farciminosum* (the cause of epizo-

otic lymphangitis) also have been associated with lymphatic system infection. The USA is currently free from glanders and epizootic lymphangitis. Treatment of infectious cutaneous lymphangitis includes appropriate antimicrobials, non-steroidal anti-inflammatory drugs, hydrotherapy, and surgical fluid drainage.

Cutaneous lymphangitis can become chronic if left untreated or if treatment is ineffective. Chronic expansion of the subcutis by edematous fluid due to faulty lymphatic vessels can result in the deposition of fibrous tissue and permanent limb disfigurement. This emphasizes the importance of rapid diagnosis and treatment of cutaneous lymphangitis.

Sporadic lymphangitis, also known as “Monday morning leg,” can also result in swollen distal hindlimbs. This condition can develop in horses that are stabled or immobile for extended lengths of time, typically days or more. The cause of sporadic lymphangitis is not well understood, but luckily the condition typically resolves after exercise.

Cutaneous lymphangitis is occasionally diagnosed at the University of Kentucky Veterinary Diagnostic Laboratory. However, the exact frequency of the condition cannot be easily estimated through typical diagnostic submissions, because diagnoses are frequently made by veterinarians in the field and don't require extensive diagnostic evaluations.

CONTACT:

Dr. Alan Loynachan
alan.loynachan@uky.edu
(859) 257-8283
Veterinary Diagnostic Laboratory
University of Kentucky
Lexington, Kentucky

Eye Neoplasia

Neoplasia is the abnormal growth of tissue which, if it forms a mass, is commonly known as a tumor. Neoplasia may be benign (tends to be less destructive) or malignant (tends to be invasive and may spread to other tissues). The spread of a tumor is known as metastasis. Tumors of the eye itself are very rare in horses, but tumors of the structures around the eye are surprisingly common. The most commonly diagnosed types of neoplasia in this area are sarcoids, melanomas, and squamous cell carcinomas. Other tumors such as lymphoma and mast cell tumors may also be found. Most tumors around the eye of the horse do not metastasize, but they can be locally aggressive and have serious effects on the welfare and use

of the horse. Early treatment of eye neoplasia is therefore strongly recommended.

Sarcoids are believed to be the most common skin tumor of the horse and can be seen in various forms. Sarcoids that occur around the eye are frequently more aggressive in nature, invading into the eyelid musculature, especially those located on the upper eyelid. Horses will usually have additional sarcoids in other locations, so a thorough examination of the horse is recommended to identify any other lesions that need to be treated. Traditionally, sarcoids were often left without treatment, but as they almost invariably become larger and more difficult to treat, early intervention is strongly recommended to avoid



Eye neoplasia.

4 long-term sequelae. Treatment may involve topical or intralesional chemotherapy, surgical procedures (most successfully by laser surgical removal), or radiotherapy. No single treatment is 100% successful for these difficult lesions. Radiation has the highest reported chance of success, but is only available in a small number of specialty centers.

Melanomas are most commonly found in grey horses and may be within the skin or affecting the structures of the eye itself. Although a majority are considered benign tumors, in horses that are not grey melanomas are likely to be malignant, and even in grey horses they often metastasize. Skin melanomas are usually successfully treated via surgical excision, but melanomas within the eye itself often require enucleation (removal of the eye). Occasionally, surgical removal of an intraocular melanoma may be successfully attempted, but this is a highly specialized surgery and is rarely a suitable option.

Squamous cell carcinomas commonly are diagnosed in the structures around the eye, and are especially likely to occur in horses with limited pigmentation of these structures. They will eventually metastasize, and early complete surgical removal is recommended as it is frequently curative, although

horses with no pigmentation will always be at risk of developing further lesions. Radiation treatment and topical or intralesional chemotherapy can also be useful in selected cases.

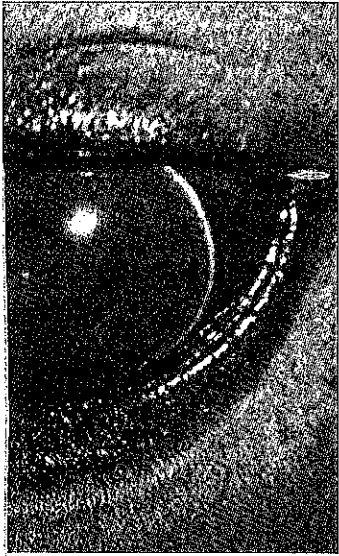
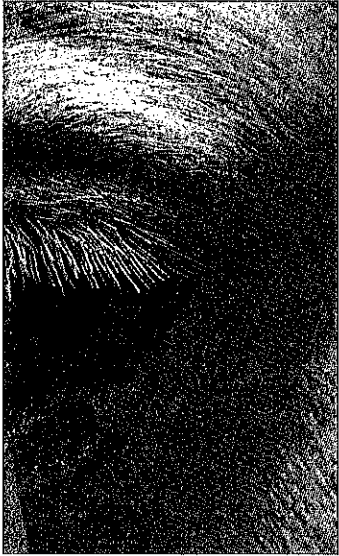
Lymphoma may occur as a mass in, on, or around the eye, and the clinical signs associated with its development will depend on its location. Although occasionally this may be a solitary mass, lymphoma has a high likelihood of involving distant structures, and without very early recognition and treatment is often fatal. Complete surgical removal of the eye and surrounding structures may be curative in some cases.

Mast cell tumors are occasionally seen affecting the structures around the eye, and can usually be successfully surgically removed. In horses (unlike in dogs) they are rarely a malignant lesion.

Other tumor types are very rare, but may present in a variety of forms. It is always prudent to seek early veterinary intervention when masses arise to maximize the chance of a good result.

CONTACT:

Anna Hollis, BVetMed, DACVIM, DipECEIM, MRCVS
anna.hollis@aht.org.uk
Animal Health Trust
Newmarket, United Kingdom



NATIONAL

Hurricane Harvey: Impact and Response Related to Texas Equids

Hurricane Harvey was a storm for the record books, striking the Texas coast in late August 2017. The storm battered communities with Category 4 winds and lingered for four days, and causing rain bands stretching 100 miles inland and 300 miles up the coast. Heavy rainfall saturated the Houston metropolitan area, with one particular location receiving in excess of 60 inches and setting a new record for rainfall totals in a single U.S. storm. While the wind did its share of damage, it was the massive amount of rain and subsequent flooding over the following two weeks that had the most devastating impact on people, animals, property, and crops.

Floodwaters reached hundreds of thousands of homes, displacing 30,000 people and prompting more than 17,000 rescues. Early state and federal disaster declarations in the anticipated impact zone were a godsend, making resources available for evacuation and response activities even as the

storm approached. Ultimately, 41 counties were included in disaster declarations due to storm damage.

These 41 counties are home to 1.6 million cattle and 88,000 horses, donkeys, and mules. While there have been major floods in portions of this area in recent years, nothing could prepare livestock owners and emergency responders for a 1,000-year event such as this. Livestock owners moved their animals to what should have been safe havens, only to have them threatened again as floodwaters continued to rise over the following days.

Emergency situations forced some livestock owners to make difficult choices, but there is at least one shining example of how pre-planning paid dividends. Parson's Mounted Cavalry Corps of Cadets at Texas A&M University and the Houston Police Department Mounted Unit exercised a standing arrangement where the Houston Police

5 train Calvary Corps horses in crowd control techniques and in exchange the Corps shelters police horses in an evacuation event such as Hurricane Harvey.

The Texas Animal Health Commission (TAHC) is the primary coordinating agency for animal response operations related to non-disease animal-related incidents and the Emergency Support Function (ESF)-11 animal-related actions. TAHC coordinated the efforts of 36 different agencies and organizations during Hurricane Harvey. More than 700 calls were received on the Harvey Hotline, and staff worked tirelessly to match resources with needs. Lists of pre-arranged livestock evacuation facilities were provided to callers through information centers. With the governor's approval, TAHC waived requirements for a current negative EIA test on evacuated horses. National Veterinary Services Laboratory quickly developed guidelines allowing approved EIA laboratories to conduct tests at shelters to mitigate disease transmission risk.

The most common maladies encountered were lower extremity skin injuries due to horses standing in water for extended periods and colic most likely due to changes in diet. The Texas A&M Veterinary Emergency Team (VET) deployed in five locations to triage, treat, and send animals to shelters or referral clinics still in operation. To manage information and utilize services of veterinarians and technicians volunteering from

Texas and across the United States, a database was created and shared with responding entities. The Texas Board of Veterinary Medical Examiners issued temporary licenses to veterinarians assisting from other states. Managing offers from volunteers and donations were challenges in themselves.

As conditions allowed, Texas A&M AgriLife Extension agents and other responders established thirteen livestock supply points in stricken areas, distributing generously donated livestock feed and supplies. USDA Wildlife Services aircraft pilots, along with volunteers in airboats, gathered coordinates on marooned livestock. National Guard helicopters, made available after human rescue missions were completed, dropped a total of 117 tons of hay to stranded livestock. More hay was delivered by airboats and high profile vehicles.

The real story of Hurricane Harvey is how owners took responsibility for their own livestock and, when conditions became extreme, how neighbors and strangers alike pulled together to help anyone in need. There were many, many more significant response efforts than are mentioned here. TAHC is honored to have been a part of this outstanding combined effort in response to Hurricane Harvey.

CONTACT:

Andy Schwartz, DVM
Andy.Schwartz@tahc.texas.gov
(512) 719-0715
Texas Animal Health Commission
Austin, Texas



KENTUCKY

Racehorse Breakdowns: The Importance of Postmortem Examinations

I often answer the question "Why would someone want a postmortem exam on an animal?" As a veterinary pathologist involved in a necropsy program for racehorses that have experienced racetrack injuries, I get much the same question from both lay people and professionals in the horse industry. People understand why a postmortem is warranted in a case of sudden death, but understanding the need for a necropsy on a horse that has sustained a catastrophic musculoskeletal injury is less clear.

Like all athletes, Thoroughbred racehorses experience a consistent pattern of repetitive use wear associated with their musculoskeletal systems. An analogy familiar to most is the term "tennis elbow." For people with even a passing familiarity with sports, "Tommy John" surgery for baseball pitch-

ers is a commonly recognized term, as rotator cuff injuries also are a familiar malady in quarterbacks.

The association between pre-existing lesions and catastrophic injuries has been documented for many years, beginning with the flagship postmortem program instituted in California. Greater than 80% of horses that suffer a fatal musculoskeletal injury have pre-existing underlying pathology related to the fracture, indicating that the final catastrophic event is the culmination of repetitive wear and not an isolated incident caused by a "bad step" or a "hole in the track." By careful examination of the horse, the acute, catastrophic injury can be documented as well as the underlying pathology. Additionally, non-musculoskeletal health issues can be addressed.

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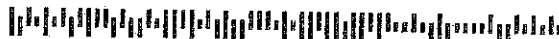
Department of Veterinary Science
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University of Kentucky
Lexington, Kentucky 40546-0099

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Mortality reviews are conducted with the trainers, the equine medical director, and the stewards following catastrophic breakdowns. The goal of these reviews is not to place blame, but to educate and implement strategies to prevent similar injuries going forward. The overall health and condition of the horse, its training and racing records, and the outcome of the postmortem examination are reviewed in the hope of identifying risk factors for that particular horse and opportunities for future intervention. Additionally, it is hoped that the trainer will disseminate the knowledge gained by sharing their experience with others, including those who work in their barn, friends, and colleagues. Health issues that may not have been clinically apparent but are identified on postmortem examination can be addressed, with informative conversations regarding such things as exercise-induced pulmonary hemorrhage (EIPH) and gastric ulcers. In a very complicated set of cir-

cumstances, the postmortem examination brings objectivity to these observations.

The ultimate goal of any postmortem program is to mitigate the risk of injury to the horse, and in turn, the exercise riders and jockeys that are involved. Catastrophic breakdowns are the leading cause of serious injury to riders, and in some tragic cases, death. While postmortem examinations may be "too late" for the horse in question, the value to the entire population of horses and to the connections of a particular horse are invaluable. We owe it to the horses, riders, trainers, and the racing community as a whole to address this issue. Breakdowns are not inevitable events. We can mitigate the risk of their occurrence in horses through careful and determined study.

CONTACT:

Laura A. Kennedy DVM, DACVP
drlaurakennedy@uky.edu
(859) 257-6393
University of Kentucky Veterinary Diagnostic Laboratory
Lexington, Kentucky