



EQUINE DISEASE QUARTERLY

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COMMENTARY

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Let's just jump to the bottom line: If you hear thunder you (and your horse) can be struck by lightning.

Summer is the long-awaited horseback riding, horse event, and trail riding season. Summer is also peak season for lightning strikes in the US, although lightning can occur year-round. According to the National Oceanic and Atmospheric Administration (NOAA), an estimated 25 million lightning strikes occur in the US every year.

Human deaths due to lightning are well documented. According to NOAA, from 2006-2014, 287 people were killed by lightning in the US. Statistics on lightning-related deaths of horses are not maintained. However after just one April 2015 thunderstorm in central Kentucky, three horses from one farm and two cattle from another farm were killed by lightning.

Organized trail rides, horse shows, race tracks, sales venues...how many have a responsible person monitoring weather who has the knowledge and authority to stop the event in case of an inbound thunderstorm? Guidelines are useless unless they are up-to-date and followed, from county horse shows to international competitions.

An outdated guideline (but one still referenced) is the 30/30 rule: If thunder is heard less than 30 seconds after seeing lightning, an outdoor event should be stopped and not started until 30 minutes after the severe weather has passed.

Don't bother counting. If you can hear thunder or see lightning, you can be struck by lightning. There is no safe place to be outdoors!

Horse event organizers have much to learn from the United States Golf Association (USGA). At USGA national championships—and at most regional and local tournaments run under USGA guidelines—an official monitors weather radar when players are on the golf course. This person

is in contact with the official-in-charge of the event who has the authority and the obligation to suspend play in the event of threatening weather.

Comprehensive evacuation plans are drawn up *before* a tournament. These plans typically designate several specific evacuation points around the golf course, where players have access either to safe areas or transportation to the clubhouse. On-course officials are required to know evacuation locations and are responsible for getting players and their caddies to safety when the horn sounds and play is suspended. Players know this standardized procedure.

How many times have you seen horse shows continuing with classes when thunder can be heard, or seen jockeys riding racehorses into a metal starting gate during a thunderstorm? We would challenge all organizers of equestrian events to develop, implement, and communicate a severe weather plan that is based on science and the safety of humans and horses. Until then, individuals need to have their own plan for safety by taking weather spotter classes, having a NOAA weather radio, getting a weather app for cell phones, and using common sense. Sitting atop a horse with metal horse shoes on is a bad place to be during a thunderstorm. Remain weather-aware and ensure people and horses are in safe places before severe weather strikes!

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LLOYD'S



First Quarter 2015

The International Collating Center, Newmarket, United Kingdom, and other sources reported the following disease outbreaks.

The final outbreak in the 2014/2015 occurrence of vesicular stomatitis in the USA was reported early in the first quarter of 2015. It involved two horses on a premises in southern Arizona, both infected with the New Jersey serotype of the virus.

One case of glanders was confirmed in Germany. There was no evidence of spread of infection to other horses on the index premises. The source of infection remains undetermined.

Outbreaks of strangles were reported by Denmark, France, Germany, Ireland, and the USA. Denmark confirmed an isolated case of the disease. A total of 14 outbreaks were diagnosed in France, involving primarily Thoroughbreds and Warmbloods. Germany and the USA reported that strangles was endemic. The disease was considered widespread in Germany. At least 16 states in the USA recorded outbreaks of strangles, with multiple cases confirmed on premises in Kentucky, Maryland, and South Carolina.

Equine influenza was reported by France, the UK, and the USA. Three outbreaks were confirmed in France and five in the UK. The USA reported influenza as endemic, with outbreaks diagnosed in Kentucky (two), Michigan (one), and South Dakota (one).

Equine herpesvirus-1 and -4 (EHV-1 and EHV-4) related diseases were recorded in France, Germany, Ireland, Japan, Switzerland, the UK, and the USA. Respiratory disease was confirmed in France (five outbreaks), Ireland (12 cases), Switzerland (undefined number on several premises), the UK (three cases, separate premises), and the USA (disease endemic, indeterminate number of cases). Abortion due to EHV-1 was diagnosed in France (eight cases, all but two on individual farms), Germany (five cases), Japan (28 cases together with deaths in eight neonatal foals on 19 premises), and the USA (five cases). EHV-1 associated neurologic disease was reported by France (one case), Germany (two cases), Switzerland (cases on several premises), and the USA (two cases). Respiratory disease caused by EHV-4 was confirmed by France (15 outbreaks), Germany (one case), Switzerland

(indeterminate number on several premises), and the UK (four outbreaks on separate premises). The UK reported one case of EHV-4 abortion.

Two cases of equine coital exanthema (EHV-3) were confirmed in the USA (Kentucky).

Numerous cases of EHV-2 infection associated with signs of respiratory disease were reported in the USA. A few were dual infections with EHV-5.

Cases of equine arteritis virus infection were recorded by Germany (carrier stallion) and Switzerland (one case). Canada and Germany reported equine infectious anemia. Four cases were confirmed on individual premises in two Western provinces in Canada; three outbreaks were recorded in Germany.

Equine piroplasmosis was considered endemic in France and the United Arab Emirates, with isolated clinical cases in non-Thoroughbreds in the latter.

Germany reported contagious equine metritis in two non-Thoroughbred stallions on one premises.

Infection with *Leptospira* spp. was confirmed by France (one case of uveitis) and the USA (two cases of abortion). The USA diagnosed six cases of nocardioform placentitis and abortion.

Cases of salmonellosis were reported by Ireland (three cases), Switzerland (two cases of *S. typhimurium*), and the USA (eight outbreaks associated with *Salmonella* Group C3 strains).

Clostridial enteritis was recorded in the USA including isolated cases of *C. perfringens* Type A in foals, two cases of *C. difficile*, and one case of *C. sordellii*. The USA also reported cases of equine proliferative enteropathy in Thoroughbred foals in two states.

Two outbreaks of rotavirus infection were recorded in France.

A fatal case of Eastern equine encephalomyelitis was confirmed in a horse in Florida, USA.

Rhodococcal-related disease was reported as endemic in the USA, with at least 22 cases diagnosed.

Infection with *Corynebacterium pseudotuberculosis* was reported as endemic in the USA.

Ireland reported three cases of atypical myopathy.



Equine Disease Quarterly

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Working Equids in Low-Income Countries— Impact of Infectious Disease

Most of the horses and donkeys in the world live with and work for poor people. The impact of these animals on the lives of poor people is enormous and global. Working equids reduce poverty, provide food security, and help promote gender equity for much of the “bottom billion” of the world’s growing population.

Despite these critical roles, somehow the world has largely forgotten these animals. We don’t even properly count them; the Food and Agriculture Organization of the United Nations’ estimate of the global equine population, at approximately 113 million, is widely regarded as a gross underestimate because of their routine omission from census data. Despite the enormous positive impact of these horses and donkeys on people, humanity frequently fails to prioritize their health.

An international Havemeyer Workshop report published in the January 2015 *Equine Veterinary Journal* described strategies to reduce the burden of infectious diseases in working equids worldwide. The task is daunting, and the solutions needed are diverse. Technical solutions such as new diagnostic tests and vaccines represent only a part of the answer, as there are extensive social-behavioral and institutional barriers to overcome.

The workshop proposed three categories of diseases. The first category includes diseases such as African horse sickness, rabies, tetanus, and gastrointestinal parasites, for which most technical barriers have been overcome, but which need improved surveillance, owner education, and advocacy at the governmental level in order to achieve progress. A second category includes diseases for which significant gaps still exist in our technical understanding and resources, such as epizootic

lymphangitis, piroplasmosis, and trypanosomiasis. A third category includes syndromic diseases, where the role of infectious agents has not been defined, including respiratory, neurologic, and anemia syndromes that are highly prevalent in these populations.

The challenges that complicate addressing infectious diseases in working equids are captured by the One Health paradigm. Both people and animals face environmental factors such as water shortage, climate change, and environmental pollution to name but a few that shape the infectious diseases from which they suffer. Impoverished humans and animals have limited access to pharmaceutical treatments that often are of questionable quality and frequently are misused in ways that can exacerbate problems such as antimicrobial resistance. For investigators like me, who have spent our careers pursuing technical advances in vaccine or diagnostic technologies, it is vital that we understand that education and advocacy, at both the governmental and local levels, are likely to be more important in addressing the enormous impact of infectious disease in working horses and donkeys. It is instructive to study the evolving behavior of major charities that operate in this area, such as SPANA, the Brooke, and the Donkey Sanctuary. While their clinical hospitals are still central pillars of activities, efforts are currently focused on building sustainable local capacity and educational development.

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NATIONAL

Atopic Dermatitis

Atopic dermatitis, defined as an allergic reaction to environmental allergens (pollens, barn dust, molds, etc.), is probably more common in horses than currently reported. It may be seasonal or, in climates such as California, year round. The three most common presentations are urticaria (“hives”), urticaria with pruritus (itching), and pruritus alone. Pruritus most commonly affects

the face and trunk. Seasonal signs would be most consistent with allergy to pollens; year-round signs would be more consistent with an allergy to molds or barn dust. Urticaria, secondary to atopic dermatitis, may be a familial problem in some horses.

Diagnosis of atopic dermatitis is based on clinical signs and the exclusion of other diagnoses (especially *Culicoides* [“no-see ums”] allergy). Horses

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may have a secondary bacterial skin infection (pyoderma), typified by excess scale, particularly in the shape of a circle (epidermal collarettes).

Intradermal tests (IDT) or serum allergy tests may be performed to identify allergens which may be used for hyposensitization (allergy shots, or more recently available, oral drops). Horses with atopic dermatitis and recurrent hives generally have a higher incidence of positive reactions than healthy horses, but the diagnosis (as in other species) cannot solely be made on the basis of the IDT or serologic testing alone. Any testing should be interpreted in light of the history of the disease and used to determine which allergens might be useful to use in hyposensitization, should the owners elect that route of treatment.

Medical therapy may include corticosteroids; prednisolone or dexamethasone are the most commonly used. Prednisolone seems to be better absorbed orally in horses than prednisone. The injectable dexamethasone solution may be used orally, although the bioavailability is 60%-70% of the injectable route. Antihistamines are sometimes quite effective: hydroxyzine pamoate, cetirizine, or doxepin (a tricyclic anti-depressant with antihistaminic effects). Antihistamines rarely cause either drowsiness or excitability in horses, although the author has seen these adverse effects in less than 5% of horses receiving these drugs. The commonly used antihistamine pyrilamine maleate has been shown

to have poor bioavailability when given orally in the horse, but detectable in the urine up to one week after a single dose, which may present difficulties with withdrawal times. Some clinicians have noted improvement when an essential fatty-acid product is added to the feed as an adjunctive treatment.

Atopic dermatitis has been successfully managed with hyposensitization, with horses showing improvement as early as two months into treatment. However, a full 12 months of hyposensitization should be given before fully evaluating its effectiveness, and veterinarians should maintain consistent communication with the client to monitor the progress of the treatment and to encourage the owner to continue with the injections for the full year. While in other domestic species it is thought that most patients will need to be maintained on the injections for life, in the horse, this may not be true, as a small number of horses have had the hyposensitization injections stopped and did not relapse. In general, approximately 70% of atopic horses improve with hyposensitization. (See below.)

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USEF Drugs and Medications Rules

► The most common medications used for the treatment of atopic dermatitis in horses are considered forbidden under the United States Equestrian Federation's (USEF) Equine Drugs and Medications Rules. As identified by Dr. Stephen D. White, these usually include antihistamines and corticosteroids. In addition to limiting the use of forbidden substances, the Equine Drugs and Medications Rules provide for legitimate use of these medications with the proper withdrawal and documentation. Conditions for therapeutic administrations of forbidden substances include that the medication must be for the diagnosis or treatment

of an existing illness or injury, and that the horse must be withdrawn from competition for a period of no less than 24 hours following the administration. Additionally, a medication report form must be filed in the competition office with the show Steward or Technical Delegate within one hour following the administration. Medication reports can also be filed online at https://www.usef.org/_IFrames/Drugs/MedicationReportForm/.

► One corticosteroid, dexamethasone, is quantitatively restricted and no medication report form is necessary. However, there are recommendations for its use that need to be strictly followed to avoid an excessive level of drug in the horse

at the time of competition. These recommendations can be found at https://www.usef.org/documents/drugsMeds/2015/drugsmedsguidelines15_web.pdf. The treatment of atopic dermatitis using hyposensitization is permitted under USEF rules as long as no injections take place within the 12 hours prior to competing; no medication report form is required. For further information regarding the use of medications while remaining compliant with the Equine Drugs and Medications rules, please visit https://www.usef.org/_IFrames/Drugs/Default.aspx or call 1 (800) 633-2472.

Dr. Stephen Schumacher, Chief Administrator, USEF Equine Drugs and Medications Program

Vesicular stomatitis (VS) is a viral disease that can affect many livestock species, most often in horses and cattle. The virus causes vesicles (blisters) that form primarily on the lips and tongue, around the mouth or nose, along the udder or sheath, or along the coronary bands. These virus-containing vesicles later rupture, forming erosions and ulcers. The disease is transmitted by biting flies, mainly black flies and sandflies, or biting midges. There is no specific treatment for the disease, only supportive care until the lesions heal. The impact of the disease on the individual horse varies, depending on the location of the lesions. Severe mouth and tongue lesions can interfere with the horse eating or drinking and severe coronary band lesions can result in temporary lameness. VS is a reportable disease in the U.S. and affected premises are placed under quarantine to prevent disease spread.

The recent identification of VS cases in Arizona, New Mexico, and Utah marked the start of a 2015 outbreak in the U.S. This comes on the heels of a significant VS outbreak during 2014 in which a total of 435 premises in Arizona, Colorado, Nebraska, and Texas were confirmed infected; 408 of which involved affected equines. The 2014 outbreak was the worst VS outbreak in the U.S. since 2005, and the economic impacts of the disease were felt within the equine industry at multiple levels. While the exact dollar amount for the economic loss cannot be quantified, Colorado was certainly the hardest hit and had a total of 370 VS-affected premises in 17 counties.

Beginning at the individual equine premise level, owners were first faced with veterinary bills for confirmation of the disease and supportive care that was needed for horses with lesions. Addition-

ally, extensive fly control was necessary to prevent transmission and the development of additional cases. Long quarantine periods, experienced while affected animals healed for an average of 30 days or more, caused additional strain and, in some cases, prevented horses from being used for their intended purpose during the prime summer and fall show season. Quarantines placed on large boarding facilities were especially difficult to manage for owners, barn managers, veterinarians, and regulatory personnel. On another level, equine events in VS-affected states also suffered serious impacts. While most events were not cancelled, unless the event facility itself had been quarantined, there was still reduced attendance at events in affected states due to movement restrictions and difficulty in getting out-of-state and Canadian horses back home after entering a VS-affected state. Finally, international movement of horses from the U.S. was impeded by destination countries imposing strict VS testing requirements or not allowing entrance of horses from certain states.

While it remains to be seen whether the 2015 VS outbreak will approach the size and scope of the 2014 experience, it seems certain that the equine industry will again have to contend with some impacts this year, economic and otherwise.

For current information on the 2015 VS outbreak, see the VS situation reports on the APHIS website at: <http://www.aphis.usda.gov/wps/portal/aphis/home/>

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Equine Tyzzer's Disease Update: January 1993-April 2015

Tyzzer's disease was originally described in mice in 1917, and since then has been diagnosed in multiple species of domestic animals and wildlife worldwide. Tyzzer's disease is highly fatal in young foals, and is caused by the bacterium *Clostridium piliforme*. The organism is an intracellular pathogen that primarily infects the lower intestinal tract

and can disseminate through the circulatory or lymphatic systems to visceral organs.

C. piliforme can cause subclinical infections, but infections are commonly acute and fatal in foals. Foals are usually found comatose or dead, but clinical signs can include depression, anorexia, pyrexia, jaundice, diarrhea, and recumbency. Affected foals

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are typically between one to six weeks of age, but most cases occur between one and two weeks of age. The disease primarily affects the liver, causing necrotizing hepatitis.

Antemortem serology and fecal polymerase chain reaction (PCR) assays can be used to test for *C. piliforme*, however results must be interpreted in combination with appropriate clinical signs to make a presumptive clinical diagnosis. A definitive diagnosis is made upon postmortem examination and is accomplished by associating the organism with characteristic liver lesions; this association can be made by microscopically visualizing the organism or by detecting the organism's genetic material by PCR. There is no known effective treatment for the disease, and vaccines are not available.

Over the last 23 years, 92 cases of Tyzzer's disease have been diagnosed at the University of Kentucky Veterinary Diagnostic Laboratory (Figure 1). The disease was identified in 44 colts, 36 fillies, and in 12 foals where the sex was not noted. Of the 92 cases diagnosed, there were 82 Thoroughbreds, three Tennessee Walking Horses, one Quarter Horse, one Standardbred, one Paint, one Morgan, and three foals without breed notation. The high number of Thoroughbreds is consistent

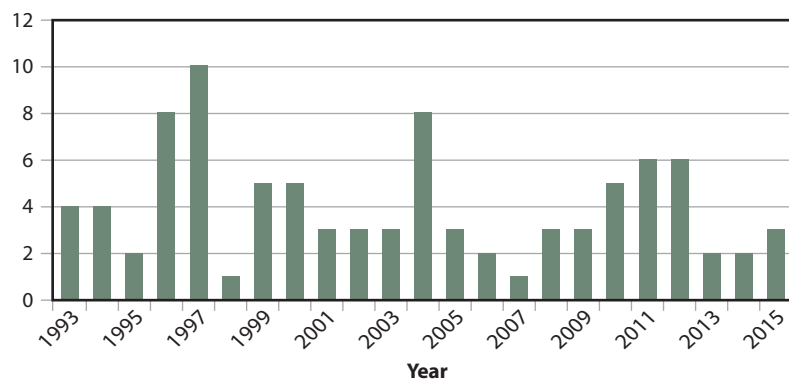


Figure 1. Incidence of Tyzzer's Disease diagnosed at the UK Veterinary Diagnostic Laboratory, 1993-2015.

with the breed distribution typically seen at the diagnostic lab. The ages of affected foals ranged from 7 to 270 days with an average age of 26 days. Fifteen foals were 30 days of age or older. Of the 92 cases, 89 died in the months of February through June. The other three cases occurred in January, July, and October.

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