



EQUINE DISEASE QUARTERLY

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OCTOBER 2007
Volume 16, Number 4



COMMENTARY

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UK

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LLOYD'S

HAPPY ANNIVERSARY!

15 years, one-and-a-half decades...however you want to think of it, this is the 15th anniversary of the inaugural edition of the Lloyd's *Equine Disease Quarterly*!

Lloyd's Underwriters and Brokers and their Kentucky agents have been staunch supporters of the publication of the Lloyd's *Equine Disease Quarterly* since its inception. That first edition in October 1992 heralded the initial distribution of 2,000 mailings to a variety of people in the equine industry. The *Quarterly* now is distributed to over 18,000 people in 94 countries on six continents. Each issue is translated into Japanese by the Equine Research Institute, Japan Racing Association in Tochigi, Japan, and also into Spanish, providing even further dissemination of equine information. Additionally, multiple lay and veterinary publications reprint individual articles from the *Quarterly*. Every issue is archived on the Maxwell H. Gluck Equine Research Center Web site (http://www.ca.uky.edu/gluck/Q_issues.asp) for reference.

In-depth, factual data interpreted in context is one of the goals of the *Quarterly*. Vast improvement in equine disease surveillance, diagnostics, biologics, pharmaceutical treatment, and medical/surgical procedures has occurred in the past 15 years. Many of these advances have been highlighted in the *Quarterly*.

Throughout the years of publication, the incidence of equine infectious diseases has been routinely reported from Kentucky, the nation, and the world. Like the *Quarterly*, horses are international travelers. They are 24 hours away from anywhere in the world, potentially taking disease conditions with them. The first issue of the *Quarterly* had brief news from the International Collating Centre. In this issue you'll read much more of disease activity from

around the world. This increased reporting is due to enhanced and expanded surveillance that has evolved over the years.

Diseases travel. The last 15 years have seen some prime examples of foreign animal diseases such as West Nile Virus (WNV) infection appearing in the United States, equine infectious anemia in Ireland, and most recently, influenza in Japan and Australia. Incredibly, an equine WNV vaccine was developed and licensed rapidly after the disease entered the United States. The Japanese/Australian influenza was diagnosed quickly due to improved testing methods, and the virus subtype was determined within approximately seven days of the first case.

Agroterrorism wasn't even thought of by veterinarians and animal owners in 1992. Now it is a household word. And, the need for disaster preparedness is highlighted by hurricanes, floods, wildfires, drought, tsunamis, and hazardous material spills.

In addition to sincere gratitude for the support of Lloyd's Underwriters and Brokers and their Kentucky agents, thanks is also due to many people: former co-editors David Powell and Lenn Harrison, current co-editors Peter Timoney and Neil Williams, and production staff Diane Furry, Martha Jackson, and Linda Millercox. To contributing authors, kudos for their efforts to disseminate factual equine information. To the readers, if it weren't for you, there would be no Lloyd's *Equine Disease Quarterly*.

Happy 15th Anniversary to all!

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INTERNATIONAL Second Quarter 2007

THE INTERNATIONAL COLLATING CENTRE, Newmarket, England, and other sources reported the following disease outbreaks:

Contagious Equine Metritis was confirmed in three trotting horses ages 7, 8, and 9 in the Orne region of France. Four cases of Eastern Equine Encephalitis were reported in Florida, USA.

Cases of respiratory disease caused by equine herpesvirus (EHV) were widely reported among a variety of horse breeds in France and in two racehorses in the United Kingdom. Abortions attributable to EHV-1 were reported among trotting mares in Orne and Saddlebred mares in the Calvados region of France. Japan reported cases of EHV-1 among Thoroughbred and non-Thoroughbred mares on five premises. Four cases were confirmed in the United Kingdom, including two attributable to EHV-4. Twenty-two cases of EHV-1 abortion were diagnosed among Thoroughbred mares during the 2007 foaling season in Central Kentucky. Cases of the paralytic form of EHV-1 were reported at the end of April at Balmoral Park, a Standardbred racetrack in Illinois, USA. Three cases of coital exanthema (EHV-3) among two Thoroughbreds and a Falabella stallion were reported in the United Kingdom.

As the result of an extensive survey among horses entering competitions or other equine events, Italy reported 136 animals seropositive for Equine Infectious Anemia, and Germany reported one confirmed case in a Warmblood horse.

A detailed report from South Africa provided information on equine fatalities that occurred in Western Cape Province between March and

May 2007 involving approximately 20 deaths on 11 premises. The cause of death was attributable to infection with Equine Encephalosis Virus Serotypes 1 (Bryanston) and 4 (Kaalplaas), not African horse sickness.

During July, equine viral arteritis was confirmed on 11 premises in France with non-Thoroughbred horses. Approximately 100 animals showed clinical signs, and seven stallions were identified as "shedders" of equine arteritis virus (EAV). Four foals died, and one abortion was confirmed following infection with EAV. Transmission had occurred through use of infected semen from four Percheron, two Normandy cobs, and an Arab stallion housed in the same facility at Haras du Pin National Stud, Orne.

Equine influenza was reported from Ireland on three premises and in Sweden, involving over 60 premises housing Thoroughbred and non-Thoroughbred racing and breeding horses. The United Kingdom reported influenza on eight premises, several of which had received animals from a sale in Ireland. A single Saddlebred horse farm in Central Kentucky, USA, also had influenza cases.

Lawsonia intercellularis was identified as the cause of illness among Thoroughbred animals on several farms in Western Cape Province, South Africa. Piroplasmiasis was identified as the cause of illness among four Thoroughbred colts on a horse farm in Turkey. Strangles was widely reported on premises in Ireland, Sweden, Switzerland, and South Africa. Two equine cases of West Nile Virus infection were reported at the end of June in California and Texas, USA. By the end of August, equine cases had been reported in 21 states.

What in the World Is Going On with Equine Influenza?

EQUINE INFLUENZA HAS APPEARED IN Japan for the first time since 1972. The first cases were observed in mid-August, and soon thereafter several hundred clinical cases appeared in multiple training centers. This outbreak prompted the Japan Racing Association (JRA) to cancel all race meetings and ban horse movements throughout the country. Meanwhile, on August 17, equine influenza was detected

in imported horses at a quarantine station in Sydney, Australia. Equine influenza is an exotic disease in Australia; it had never been detected there before.

The horses remained in quarantine, but the virus did not. On August 24, influenza was detected at an equestrian center in central Sydney. It has since spread to many other premises in New South Wales and Queensland, Australia.



Equine Disease Quarterly

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In response, the Australian Minister for Agriculture, Fisheries and Forestry called it the most serious disease threat Australia's horseracing industry had ever faced and issued an order for a national standstill in movement of horses, donkeys, and mules.

Equine influenza is a common upper respiratory disease of the horse. Typical symptoms include fever, nasal discharge, and a dry hacking cough. It is considered enzootic in the USA and Eurasia and has also circulated widely in South America, China, and India. There are several vaccines available, and the current generation of vaccines has been carefully tested to prove effectiveness.

Since Australia previously was free of equine influenza virus, vaccination was not practiced, and the horse population had no immunologic protection: an ideal condition for equine influenza to spread very quickly.

Rapid diagnostic testing and virus nucleotide sequencing revealed that the Japanese and Australian viruses are subtype H3N8, which is the same subtype as all other equine influenza viruses currently circulating (see figure 1). The viruses are related to other recent equine influenza viruses and are not unique. As of August 30, no fatalities had been reported.

Equine influenza is occasionally fatal in young foals lacking protection from maternal antibodies. But with appropriate veterinary care, it is rarely fatal even in naïve horses from weanling age onwards. Sometimes, especially in vaccinated horses, the clinical signs are so mild as to be overlooked, which is another reason why influenza spreads so easily: unrecognized subclinical cases can still shed virus that is infectious to contact horses.

Effective quarantine is the best prevention against the introduction of disease. Australia, Japan, South Africa in 2003, and also Hong Kong in 1992 used quarantine systems for imported horses with the explicit purpose of keeping exotic diseases like equine influenza out of their countries. In both South Africa (2003) and Australia (2007) it appears that their quarantine systems did succeed in keeping influenza-infected imports separate from the general horse population, but they failed to stop the transfer of the virus itself into the general population. This transfer strongly suggests that influenza might have been carried out of the quarantine facilities by incidental human activity—perhaps

in unwashed horse trailers, on unwashed hands or equipment, or on clothing. The influenza virus particle is easily killed by soap or common disinfectants, but it can survive for hours or days in the environment and even longer if kept cool and moist. Vigilance against the spread of influenza viruses on contaminated materials or unwashed hands is an essential part of quarantine. Equine practitioners and handlers who have contact with both sick and healthy horses in a day's work must be always careful and never complacent.

Influenza is a moving target—the viruses mutate and gradually change so that the vaccinated horse's immune system no longer recognizes them. Vaccines need to be updated to keep up with the changing virus. The Office International des Epizooties (OIE) has an equine influenza expert surveillance panel that annually reviews the international situation and makes recommendations regarding the best virus strains to use in vaccines. The lynchpins of the surveillance system are the OIE international reference laboratories for equine influenza, located at the Animal Health Trust (Newmarket, United Kingdom), the Maxwell H. Gluck Equine Research Center (Lexington, Kentucky, USA), and the Institute for Medical Microbiology (Munich, Germany). The latest recommended update, originating in 2004, is that vaccines should contain strains similar to the South Africa/2003 virus and the Newmarket/2/93 virus. It takes time for updated recommendations to be translated into commercially available products, and to date no vaccine in the USA exactly meets the latest recommendation. Fortunately, the current generation of vaccines still retains some effectiveness.

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Wise Use of Antibacterial Drugs

ANTIBIOTICS AND SYNTHETIC ANTIBACTERIAL drugs have revolutionized the ability to treat bacterial infections in human and animal patients. These drugs deserve careful use to preserve and optimize their effectiveness. Deciding on a treatment plan should begin with the decision of whether an antibacterial drug is indicated. If indicated, the most appropriate drug should be delivered by the best route at the right dose and duration for the specific type of infection. A veterinarian should play a critical role in this decision making.

Adverse outcomes with antimicrobial drugs are rare but difficult to predict. For example, some horses react to an injection of procaine penicillin by collapsing or becoming hyperexcitable. Others may develop severe diarrhea and toxemia when treated with an antibacterial drug due to disruption of normal intestinal flora and bacterial overgrowth. The cost of treatment, including price of the drug and labor to administer it must be considered along with the horse's behavioral response to treatment. Another important consideration in using antibacterial drugs is the risk of bacterial resistance. Bacteria can become resistant to antimicrobial drugs by a specific non-fatal genetic mutation, or through the transfer of resistance genes from one bacterium to another (within or across genera or families of bacteria).

Transfer of resistance genes, acquired resistance, is much more common than mutation. With the newly acquired resistance genes, the bacteria are more "fit" to survive in an environment where that antimicrobial drug may be present. This leads to a selective advantage over bacteria that do not possess these resistance factors. Resistance genes may be transferred from non-pathogenic bacteria that reside in the animal, for instance in the digestive tract or nasal passages, to pathogenic bacteria which can cause diseases that are more difficult to treat.

Resistance among bacteria to first line antibacterial drugs may require the use of newer and more potent antibacterial drugs in order to treat infections. These newer and more potent drugs can be more expensive and are often the drugs suggested to be reserved for the treatment of human infections that are resistant to first line antibacterial drugs. For example, some isolates of *Staphylococcus aureus* are resistant to methicillin and other related drugs

such as penicillin (called methicillin-resistant *Staphylococcus aureus*, MRSA). Some gastrointestinal bacterial isolates of *Salmonella* spp and *Escherichia coli* have also been found to be resistant to multiple antibacterial drugs.

Antimicrobial exposure does appear to select for these resistant populations of bacteria either transiently or long term. In one study, normal fecal flora bacteria were found to be more resistant to several antimicrobial drugs when the horses were being treated with antibiotics for various conditions when compared to other hospitalized horses or horses residing on their home farms. Although these bacteria were not likely to cause disease, they could serve as a source of resistance genes for pathogenic bacteria. The same study found that horses hospitalized but not being treated with antibiotics were more likely to have resistant fecal flora than were horses residing on their home farms. The results of this study would suggest that just being in a hospital can lead to some kind of selection pressure on fecal flora. This study, along with others, illustrates that antibacterial drugs should be used only when indicated, with appropriate product selection and dosing regimen.

For example, antibacterial drugs are not indicated to treat a horse with a fever due to uncomplicated viral respiratory infection. Viral infections can not be cured with antibiotics. Certainly if the patient has secondary bacterial infection antibiotics would be indicated. Additionally, minor superficial wounds that do not involve the joint or tendon can often be managed with prompt, thorough cleansing and bandaging, and may not require the use of oral or injectable antibiotics.

Without question it is preferable to prevent infections as opposed to having to treat with antibiotics. In the USDA National Animal Health Monitoring System's Equine 2005 study, the most common reason foals and horses were treated with antibiotics was wounds/injury or trauma. Reducing the likelihood of wounds and other traumatic injuries by providing safe housing and fencing, along with optimal hauling and training methods might reduce the need to use antibiotics in the equine population. Use of vaccination and biosecurity procedures can also reduce the risk of many types of equine infectious diseases. Monitoring horses for signs of illness along with prompt diagnosis and

implementation of isolation procedures can reduce the risk of spread of contagious disease agents to other horses.

Although antibacterial drugs are generally affordable, available and safe, careful consideration of the pros and cons of their use must be made in order to provide the best possible care to horses. None of those involved in

equine care would like to envision the loss of effectiveness of these valuable tools.

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Methicillin-resistant *Staphylococcus aureus*

STAPHYLOCOCCUS AUREUS IS A COMMON bacterium and an important cause of disease in many species. Approximately 10% of healthy horses carry *S. aureus* in their noses. This occurrence is termed “colonization,” as the bacteria are present without causing any problems. A smaller number are colonized in the intestinal tract or on the skin. *S. aureus* is an “opportunistic pathogen” that can cause disease under certain conditions. One problematic trait of *S. aureus* is its tendency to become resistant to antibiotics. Of particular concern is methicillin-resistant *S. aureus* (MRSA), which is resistant to all beta-lactam antibiotics (penicillin and cephalosporin families) and often many other antibiotics. This makes MRSA infections more difficult to treat.

In humans, MRSA infections are associated with increased illness and death compared to methicillin-susceptible *S. aureus* infections. MRSA is a tremendous problem in human hospitals and is now causing disease in people in the general population. But MRSA has also emerged as an important cause of disease in many animal species, including horses.

Like methicillin-susceptible *S. aureus*, MRSA can colonize horses without causing any problems. Studies have reported carriage rates of 0-5% in horses in the general population, but on some farms the prevalence can exceed 50%. Colonized horses may never have any problems with MRSA, but they are more likely to develop an MRSA infection under certain conditions. Colonized horses are also of concern because they can transmit MRSA to other horses and people. Clinical MRSA infections can occur as sporadic cases or outbreaks. A wide range

of infections can develop. In horses in the general population, skin and soft tissue infections (including wound and surgical site infections) and joint infections are most common. In hospitalized horses, surgical site infections predominate. Invasive device (i.e., intravenous catheter) site infections and bloodstream infections can also occur, as well infections at a variety of other sites.

Despite the obvious concerns about MRSA, it can be a treatable condition. In a multicenter study, over 80% of horses with MRSA infections survived, although they tended to have prolonged hospital stays and often required additional surgeries. While MRSA strains are resistant to many drugs, acceptable antibiotic options usually exist. The key to proper and successful management is early diagnosis of MRSA so that appropriate therapy can be instituted.

Typing of MRSA strains is an important tool for understanding how and why this organism is spreading. In humans, MRSA is separated into community-associated and hospital-associated infections. Care should be taken in directly extrapolating this situation to horses, as there are a number of differences. One major difference is the types of MRSA found in horses. Most reports of MRSA in horses have involved one family (clone) of MRSA. There are various names for this family, depending on the location and typing method. They include USA500, Canadian epidemic MRSA5, sequence type 8 (ST8), and clonal complex 8. This MRSA strain (or closely related strains) are recognized as a human strain, yet the strain is uncommon in people. Its predominance in horses suggests

that it is somehow better adapted to horses than other strains. This strain has been reported in both North America and Europe and is likely widely disseminated internationally.

One MRSA aspect of concern is the potential for transmission between humans and horses, in both directions. People who work with horses appear to be at particularly high risk for MRSA colonization. Studies of equine veterinarians have reported colonization rates of 10-14%. The MRSA clone that predominates in horses has been the most common strain in equine personnel, providing further support for the notion that horses can infect humans.

An outbreak of MRSA skin infections occurred in a teaching hospital in people working with a colonized foal. Therefore, precautions need to be undertaken to reduce the risk of infection of human contacts and to prevent transmission of MRSA on farms or in clinics. Infection control practices that may need to be implemented at the farm or clinic level are

variable and depend on the situation. They may include isolation of infected or colonized horses, the use of barriers (gloves, gowns) when handling infected or colonized horses, improvement in general hygiene (especially hand hygiene among farm workers and veterinarians), screening of horses for colonization, limiting contact of different groups of horses, and other related infection control measures.

No current evidence exists that antibiotics are useful for eradication of colonization, but MRSA can be eradicated without the use of antibiotics from farms with infection control practices if adequate time and energy are committed. All aspects of the equine industry need to be aware of this veterinary and zoonotic pathogen, because MRSA is likely to be an increasing concern in equine medicine.

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Equine Disease Quarterly Newsletter

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strip-in area centered between vertical lines on pages 3 and 4.

Figure 1.

Electron Micrograph of
Influenza Virus

