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COMMENTARY

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In this world nothing can be said to be certain, except death and taxes."

I will add another certainty to Benjamin Franklin's observation, and that is change. Recently attending my 30-year veterinary school class reunion made that abundantly clear.

When I attended veterinary school, the board certified radiologists were learning how to use the newly acquired, latest imaging technology—the ultrasound machine. Pain management for horses primarily consisted of flunixin meglumine, phenylbutazone, and narcotics. The rapid, specific test called polymerase chain reaction was in no one's vocabulary (yet).

People communicated via mail, telephone, or the radio in the veterinary practice vehicle. When having a meal with a friend or colleague, no one was interrupted by a text, cell phone call, or "bling" of an incoming email or social media post. Computers had disk operating systems (MS-DOS) and a basic personal computer cost $2,300 ($4,200 in today's dollars).

Communication has always been important in the relationship between veterinarians, clients, and co-workers. However, at the 2015 American Veterinary Medical Association Convention, it was sobering to see the numerous lectures on cyberbullying and workplace bullying. Bullying isn't limited to playgrounds anymore; it is in the workplace and online and is a serious issue. People now have the ability to "comment" about anyone, on anything, at any time via social media and internet sites. While this can be helpful when users rate a book, movie, new computer or phone app, baseless, vicious comments are rarely productive and may result in criminal or civil charges. Truthful complaints are best reserved for the local Better Business Bureau rather than anonymously online.

Yet some things have not changed and likely never will. Nothing will ever replace a thorough history and physical examination of an animal as the first steps in disease diagnosis. All the cutting-edge diagnostic testing, imaging and monitoring tech-niques must be interpreted in light of the behavior and clinical signs exhibited by the patient. As my anesthesiology professor pounded into us as vet-erinary students, "Look at your patient as well as the machines! The patient never lies!"

And while diagnosticians have an ever increasing arsenal of testing procedures for equine diseases, many challenges remain. Just because a horse has an antibody titer to a pathogen doesn't necessarily mean it has the disease; it may simply mean the horse has been exposed to the pathogen and/or that it was vaccinated. How high is the titer, and what diagnostic method was used? What are the sensitivity and specificity of the test? All is dependent upon appropriate interpretation of the test result in conjunction with the patient history and physical examination.

Thirty years from now our current technology will be similarly outdated and likely be viewed as archaic by a new generation. Death, taxes, and change will always be with us. One other axiom—by John Lubbock—is also timeless: "There is nothing so good for the inside of a man as the outside of a horse."

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INTERNATIONAL

Third Quarter 2015

The International Collating Centre, Newmarket, United Kingdom (UK), and other sources reported the following disease outbreaks.

Vesicular stomatitis (New Jersey serotype) was reported in the USA, with 192 virus-confirmed outbreaks in eight states: Arizona, Colorado, Nebraska, New Mexico, South Dakota, Texas, Utah, and Wyoming. Disease was additionally identified on 335 premises based on clinical signs.

Influenza was reported by France, the UK, and the USA. Two cases were involved in a single outbreak in France. The UK confirmed three outbreaks: single cases on two premises and several affected animals on a third premises. All cases involved unvaccinated horses or ponies. Influenza was reported as endemic in the USA with outbreaks confirmed in five states.

Equine herpesvirus-1 and -4 (EHV-1, -4) related diseases were recorded in Argentina, France, Germany, Ireland, the UK, and the USA. EHV-1 associated respiratory disease was diagnosed in Germany (isolated cases), Ireland (single case), the UK (single case co-infected with strangles), and the USA (several states). EHV-1 abortions were reported by Argentina, France, the UK, and the USA. Two outbreaks were identified in France involving Thoroughbreds and French Trotters, and single cases were confirmed in Argentina, the UK, and the USA. One case of EHV-1 myeloencephalopathy was recorded in France. Outbreaks of EHV-4 respiratory disease were confirmed in France (11 outbreaks) and Germany (three outbreaks).

Strangles was recorded in France (13 outbreaks), Germany (five premises), Ireland (21 cases in four provinces), Switzerland (three outbreaks), and the UK (one outbreak). Strangles was reported as endemic in the USA with disease confirmed on 18 premises in 11 states.

Switzerland reported a single case of EHV-5 co-infection with *Theileria equi.* Multiple cases of either EHV-2 or EHV-5 were confirmed in the USA.

Equine arteritis virus infection was reported in a Warmblood stallion in Germany.

Canada confirmed 41 cases of equine infectious anemia in four western provinces, the majority in Saskatchewan and Alberta.

Equine piroplasmosis was reported as endemic in France.

Germany and South Korea confirmed outbreaks of contagious equine metritis. Germany recorded outbreaks involving 19 non-Thoroughbreds on four premises, one of which involved two stallions and 14 mares on an Icelandic horse farm. Seventy-one positive Thoroughbreds on 36 premises were identified in South Korea.

One case of coital exanthema (EHV-3 infection) was diagnosed in the USA. The USA also reported two cases of nocardioform placentitis, both associated with *Amycolatopsis* spp.

Salmonellosis was recorded in Germany (one case), Ireland (one case), and the USA (several outbreaks involving Group B and C1 *Salmonella* spp). The USA diagnosed proliferative enteropathy due to *Lawsonia intracellularis* in two foals. Outbreaks of rotavirus infection were reported in France (two outbreaks) and Germany (one case). Two cases of clostridial enteritis associated with *C. perfringens* Type A toxin were identified in the USA.

Thirty-six cases of Eastern equine encephalomyelitis (EEE) were diagnosed in eight states in the USA, with Florida and Texas having the most numerous cases. The vast majority of EEE cases were in unvaccinated horses.

West Nile virus infection was reported in France and the USA. Thirty cases were confirmed in France; all but one occurred in two geographic areas. The USA reported 58 cases, with the greatest numbers in Texas, Washington, and Colorado, nearly all in unvaccinated horses. Switzerland confirmed two cases of tick-borne encephalitis.

A Getah virus outbreak was reported in Japan involving 25 Thoroughbred horses on one premises. The majority of cases occurred in two year olds, 10 of which had not been vaccinated.

Rhodococcal disease was reported as endemic in the USA, with numerous outbreaks in various states.

Single cases of the following diseases were reported during the third quarter of 2015: ehrlichiosis and borreliosis (Switzerland); and anthrax, neorickettsiosis, and pythiosis (the USA).

Equine Disease Quarterly

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Equine Glanders: A Diagnostic Approach in Germany

Glanders, one of the oldest known zoonotic infectious diseases, is caused by the bacterium *Burkholderia mallei*. Infection with *B. mallei* may cause clinical signs in horses after an incubation time of three to five days or longer. The disease is widespread in several countries in South America, the Middle East, Asia, and Africa. During the last five years, cases were reported from Afghanistan, Bahrain, Germany, Kuwait, Lebanon, Brazil, Mongolia, Myanmar, Eritrea, India, Iran, Pakistan, and Russia. Notification to the World Organization for Animal Health (OIE) is compulsory for OIE member states. Impacted countries face rigorous restrictions in international trade of equids and their products for at least six months.

In 2014, after 60 years of disease freedom, Germany identified a glanders positive horse. Glanders had been considered eradicated in Western Europe since the 1960s. This initiated an international discussion concerning adequate methods to confirm infection or disease.

A glanders case definition is not available from the OIE. Consequently, each country must implement its own regulations. For serological testing and confirmation of clinical suspicion, Germany relies on the OIE prescribed complement fixation test (CFT) in combination with the immunoblot technique. The CFT is prescribed for international trade by OIE. Unfortunately, the CFT result is influenced by many parameters, such as the bacterial strains used for antigen production—we use a certified CFT antigen (ccpro, Oberdorla, Germany); the complement and hemolytic systems (standardized components are advised to minimize intrinsic variation); and technical aspects, such as incubation time and temperature.

The highly specific immunoblot (IB) for glanders is used to exclude false positive CFT results. Validation data confirm that the IB test is only positive for infected animals. It must, however, be validated for different geographic regions. IB validation, following OIE recommendations, is an ongoing project not yet finalized at the glanders OIE reference laboratory in Germany. The 2014 case of glanders in Germany was identified by this test combination.

According to our experience, clinically normal but infected (i.e., IB positive) horses do not show classic clinical signs. Therefore, the detection of *B. mallei* in these horses is highly challenging. At necropsy, a thorough search for lesions especially in nasal cavity, skin, and internal organs is necessary, since they are often barely visible. All lesions and aberrant tissues must be sampled for further analysis. To investigate if a horse is infected with *B. mallei*, a combination of techniques is used. These include cultivation, polymerase chain reaction test (to detect *B. mallei* DNA), histology (to exclude other diseases), immunohistochemistry (IHC) to visualize *B. mallei* antigen in tissue sections, and experimental infection of guinea pigs. Finally, detection of *B. mallei* may still fail in a significant number of cases, because few bacteria are present in glanderous lesions. These laborious and time consuming procedures require up to seven weeks to complete before final results are available.

In Germany, serologically positive CFT results for glanders must be immediately verified by IB at least twice. Horses that test CFT positive but IB negative have to be re-tested three times at two- to three-week intervals; horses that remain negative are considered uninfected. Suspicious and outbreak populations must be re-tested at least three times in two- to three-week intervals with negative CFT results before restrictions on these populations can be lifted. Positive CFT results that have been confirmed by IB are considered as proof for *B. mallei* infection, even in the absence of clinical disease or detection of *B. mallei*. Additionally, isolation, molecular identification and/or IHC identification of the agent in characteristic lesions constitute unambiguous proof of *B. mallei* infection.

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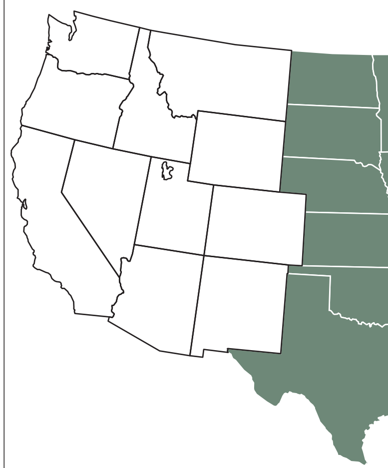
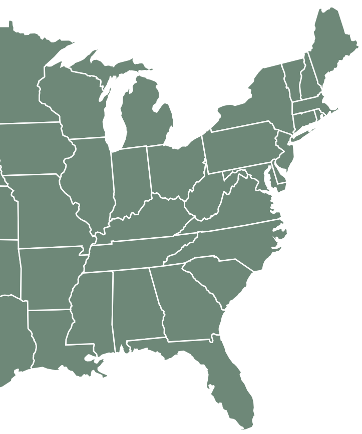
Figure 1. U.S
of blister bee



S. geographic distribution
etles.



NATIONAL

Blister Beetles and Alfalfa: A Potentially Lethal Mix

Blister beetles belong to a family of plant-feeding insects (Meloidae) that produce cantharidin, a toxic defensive chemical. Contact with it in the blood of live or dead beetles causes blistering of the skin or mucous membranes of sensitive mammals, especially horses. Cantharidin is stable and remains toxic in dead beetles for a long time, so animals may be poisoned by eating crushed beetles in cured hay. The severity of the reaction depends upon the amount of cantharidin ingested and the size and health of the animal. The lethal dose for livestock is estimated to be 0.45 to 1.0 mg of the chemical per kilogram of body weight.

Clinical signs associated with poisoning usually appear within hours and include irritation and inflammation of the digestive and urinary tracts, colic, urinary straining, and frequent urination. This irritation may also result in secondary infection and bleeding. In addition, calcium levels in horses may be drastically lowered and the heart can be damaged. Since animals can die within 72 hours, it is imperative to contact a veterinarian as soon as blister beetle poisoning is suspected.

Meloids in the genus *Epicauta*, especially the striped blister beetle group (*E. occidentalis*, *E. temexia*, and *E. vittata*) are most commonly associated with poisoning of equids. Blister beetles are attracted to flowering alfalfa, or other blooming plants, and may be trapped and crushed in hay during harvest. Blister beetles can be found in the Central and Eastern United States (see Figure 1). In addition to their high cantharidin content (approximately 4 mg/beetle), striped blister beetles tend to congregate in large clusters along field margins. This can result in high concentrations of beetles in baled hay. Additional blister beetle species have been identified in poisonings in other areas of the United States.

Reducing the Potential for Blister Beetles in Hay

Tips for Hay Producers:

- Learn to recognize blister beetles and understand their behavior. An effective preventive program will reduce potential problems. There is no efficient way to inspect baled hay carefully enough to ensure that it is free of blister beetles or cantharidin.
- Blister beetles usually are not active when the first cutting of alfalfa hay is made; harvest at the late bud stage or when the first flowers open for high quality horse hay.
- Blister beetles are attracted to blooms. Manage harvest intervals to minimize flowering of alfalfa or weeds in hay fields. Practice good broadleaf-weed management.
- Check hay fields for blister beetles before cutting from July through early September. They prefer blooming plants and tend to cluster in masses near field edges. Avoid harvesting areas where beetles are present.
- Avoid crimping hay during harvest. Straddle cut swaths to avoid crushing beetles with tractor tires.

Tips for Horse Owners:

- Reduce the risk of feeding blister beetles to horses by understanding blister beetle basics, and by taking the following precautions:
- If practical, grow your own alfalfa to ensure proper preventive management practices.
- Develop a relationship with your hay producer or broker so that you know their production practices and hay quality.

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Hand Protection

Human skin is the primary barrier against microbes, toxins, and physical injury. In equine veterinary care, gloves spare humans from exposure to harmful organisms, toxins, and pharmaceuticals such as progesterone analogs and other hormone products, topical nonsteroidal antiinflammatory drugs (NSAIDs), oral sedatives, and antimicrobial drugs like chloramphenicol.

In 1994, the Occupational Safety and Health Administration (OSHA) published personal protective equipment standards (29 Code of Federal Regulations) to regulate workplace protection with a focus on respiratory protection. Hand protection and workplace clothing have been the subjects of minimal regulation.

Disposable gloves are made of different materials with different levels of protection. The typical rectal palpation glove prevents skin contact with feces, but does not protect against substances such as bleach. A latex glove keeps hands clean when dealing with body fluids, but provides little skin protection against chemicals.

Glove protection has several measures. Penetration refers to punctures or tears in the glove. Permeation describes the ability of a substance to pass through an intact glove without damaging the glove material. Permeation is measured by breakthrough time (BTT). Degradation indicates alteration of the physical properties of the glove material upon exposure to chemicals.

Each glove manufacturer produces a glove selection chart to describe its products' protection against specific compounds and solvents. Manufacturers of chemicals (including pharmaceuticals) have a Safety Data Sheet (previously known as Material Safety Data Sheets) that lists personal protective equipment (including recommended glove type) as well as other valuable information. However, for some chemicals, the gloves for hand protection are simply listed as "impervious" in which case, basic knowledge about glove types is critical.

Skin exposure occurs before there is a perception of leakage through a glove. Measures of permeation and degradation vary considerably between glove manufacturers. More importantly, the reported protection often does not reflect the true protection in the field. Wide variations in BTT occur due to variations between batches, effects of ambient temperature and humidity, and hand motion. Hand motion alone has been reported to significantly alter BTT.

Disposable glove choices are generally limited to latex, nitrile, or vinyl. Each glove has its own attributes. Latex has a smooth fit, offers good dexterity, and protects from bodily fluids and pathogens. However the material can cause allergic reactions, degrades readily from exposure to chemicals and disinfectants, and punctures can be inapparent.

Nitrile is a synthetic polymer so there is less allergic stimulation and it is puncture resistant. Tears are easily seen. The fit is good, which reduces hand fatigue and snags. Nitrile has good resistance to both chemicals and to microbes.Vinyl gloves are commonly used in the food industry and offer the least protection against many chemicals. The glove is not affected by movement, but can be a poor fit.

Rubber or neoprene gloves are recommended when using many disinfectants as these chemicals can be caustic and irritating to skin.

No one glove material is resistant to all different chemicals. Disposable gloves are meant to be discarded and not reused. Read the package insert of any chemical, pharmaceutical, pesticide, or disinfectant for information on personal protective equipment, including specific glove recommendations.

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KENTUCKY

Equine Lymphosarcoma

Lymphocytes are an important component of the equine immune system. Like all cells within the body, lymphocytes have the potential to undergo neoplastic (cancerous) transformation that results in uncontrolled regulation and growth. Lymphosarcoma is the proliferation of neoplastic lymphocytes.Equine lymphosarcoma is relatively common, but the exact incidence is unknown. The majority of cases occur in horses aged 4-15 years, but cases have been described in horses of all ages. Epidemiologic studies suggest no apparent gender or breed predisposition. Like many equine cancers, the cause of lymphosarcoma is rarely identified, but certain bacteria and viruses have been implicated in its development.

Four anatomical categories are frequently utilized for classification of lymphosarcoma. These categories include: multicentric (generalized or within multiple locations), thymic (mediastinal, within the chest cavity), alimentary (intestinal), or cutaneous (skin or extranodal).

Clinical signs may develop abruptly or over several months. Signs can develop due to organ dysfunction directly related to infiltration by neoplastic lymphocytes; physical obstruction caused by neoplastic masses; or from neoplastic byproducts (paraneoplastic syndrome). Depression, weight loss, subcutaneous edema, fever, anemia, and lymphadenopathy (swollen lymph nodes) are the most commonly observed clinical signs,

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but signs can vary based on the affected organs. Multicentric, thymic, and cutaneous forms can compress the airways and esophagus and result in respiratory or swallowing abnormalities. The intestinal form can result in colic, diarrhea, and weight loss. Cutaneous nodules may be observed in or under the skin; these masses can be influenced by hormones, thus may wax and wane in size. Various paraneoplastic syndromes have been described in horses and include: hypercalcemia, pseudohyperparathyroidism, pruritus and alopecia (itching and hair loss), and immune-mediated hemolytic anemia and thrombocytopenia.

Veterinarians may suspect a diagnosis of cancer after visualization of cutaneous nodules, transrectal palpation of abdominal masses, or detection of masses by radiology, ultrasonography, or surgery. Clinical differentiation of neoplasia from non-neoplastic lesions is difficult. A definitive diagnosis of lymphosarcoma is made by microscopic visualization of neoplastic lymphocytes in body fluids, fine needle aspirates, surgical biopsies, or necropsy samples.

The majority of horses diagnosed with lymphosarcoma either die or are humanely euthanized within months after developing clinical signs. Horses with the cutaneous form typically have longer survival times in comparison to those with other forms. Treatment is infrequently attempted, but temporary improvement may occur following surgical excision, or treatment with hormones, chemotherapeutics, immunomodulators, and corticosteroids.

The University of Kentucky Veterinary Diagnostic Laboratory diagnosed 57 cases of equine lymphosarcoma from September 2009 to September 2015. Diagnoses were made from 30 surgical biopsies, 23 necropsies, and four cytologic examinations. These cases represented 51 horses of seven different breeds. The age of affected animals ranged from a fetus at 300 days of gestation to a 27-year-old gelding; the mode was three years of age and included six cases. Cases were composed of 21 multicentric, 15 cutaneous, 13 lymphoid (lymph node, spleen, or thymus), and five alimentary lymphosarcomas. Additionally, one case was diagnosed from thoracic effusion (fluid) and two cases from abdominal effusions.

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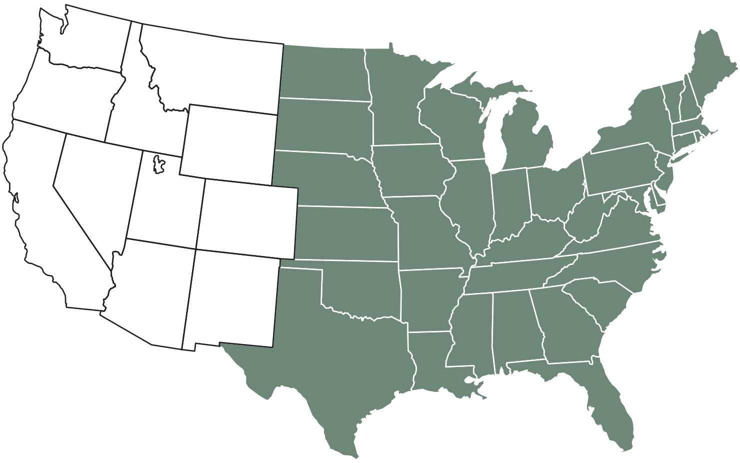
Figure 1. U.S. geographic distribution of blister beetles.



Source:
http://www2.ca.uky.edu/entomology/entfacts/ef102.asp