A lot has changed over the past decade and a half, including the horse world. Although you may muck a stall today the same way you mucked a stall in 1991, and a posting trot will always be a posting trot, advances in research have ensured that equine veterinary medicine continues to evolve. A horse's role as primarily a companion animal in the U.S. has given new emphasis to the human-animal bond, and horse owners today demand high-level care. Here are some highlights of the advancements in equine medicine since the turn of the century.

**Deworming**

One of the biggest changes that has influenced almost every horse owner is the new recommendation for intestinal parasite control. Gone are the days of deworming an entire barn on a fixed, repeatable schedule. Studies over the past 10 years increasingly report cases of parasite resistance to dewormers commonly used on farms, such as ivermectin and fenbendazole.

In an effort to slow the development of parasite resistance on horse farms, parasitologists and veterinarians are now recommending horse owners have fecal egg counts taken on their horses prior to treatment to determine which animals should be dewormed more frequently and which require minimal treatment. This way, veterinarians can identify “high shedders,” meaning horses that shed the majority of parasite eggs. Not every horse in a herd needs to be dewormed every six weeks, since overdeworming can hasten the development of parasite resistance.

**Disease Control**

Biosecurity has been a huge buzzword over the past decade, and with more horses traveling, and traveling farther, contagious disease continues to be a threat. Many diseases, such as rabies, Eastern and Western equine encephalitis (EEE/WEE) and tetanus are still around but kept at bay with appropriate vaccination programs.

Recent outbreaks of equine herpesvirus 1 (EHV-1) further illuminate the threat of contagious disease. The most recent outbreak in the spring of 2013 that spread quickly from a National Cutting Horse Association event in Ogden, Utah, demonstrated the need not only for heightened biosecurity awareness in horse owners, but also for the need for a better vaccine. Currently, aggressive vaccination against EHV-1—up to four times a year—is recommended for at-risk horses. A workshop was held in fall 2013 for researchers to discuss the development of vaccines with higher efficacy and an antiviral drug.

Although not seemingly new anymore, West Nile virus (WNV) was identified in the U.S. in 1999 and quickly spread across the country. An excellent, and scary, example of how fast an infectious disease can spread, WNV is also a good example of how a properly instituted vaccination strategy can curtail further infections. Considered a core vaccine by the American Association of Equine Practitioners, the WNV vaccine resulted in a reduction from over 15,000 cases in 2002 to just over 300 cases in 2013. International travel allows for easy transmission of foreign animal diseases. Equine piroplasmosis, a blood disease spread by certain species of ticks, was eradicated from the U.S. in 1988, but recent outbreaks in Southern states such as Texas, New Mexico and Florida highlight the continued need for horse owners to be vigilant. Quarantines, up-to-date vaccination schedules, and proper ID remain important biosecurity measures for any farm.

**Diagnosing and treating EPM has come a long way since the year 2000. Photo: Lesley Ward**

**Diagnostics**

The equine vet who makes farm calls nowadays is likely to be equipped with a greater array of portable technologies than ever before. In radiology alone, digital X-rays have taken the equine world by storm. Enabling veterinarians to develop high-quality images on the farm as opposed to at the clinic has launched diagnostic imaging headfirst into the 21st century.

Portable ultrasounds are also much more common, allowing practitioners to use this multifaceted diagnostic tool for many things, including reproductive and lower-limb soft tissue imaging. More advanced imaging at veterinary schools and some large equine specialty clinics include magnetic resonance imaging (MRI) and computed tomography (CT) scans. Standing versions of CT scans are slowly becoming more widely used along with even smaller “portable” machines. The complexity of the CT scanner has also increased over the past decade, providing 3D images with higher resolution. Nuclear scintigraphy (bone scans) and infrared photography are also increasingly available for extensive lameness workups.
Using biomarkers for early detection of osteoarthritis (OA) and other musculoskeletal diseases in horses is a new diagnostic tool. The concept of detecting molecules in a horse's blood that signal early OA prior to lameness or radiological findings is still in its infancy but offers intriguing and potentially life-saving clues to this common and chronic condition.

Although the complex disease laminitis continues to be a challenge, new research over the past decade has provided far-reaching connections between a horse's metabolism, insulin levels and the vital vasculature encasing the coffin bone. Vets are more easily able to diagnose horses and ponies with metabolic syndrome—a condition characterized by obesity, insulin resistance and laminitis—allowing owners to change their horses' management and prevent future cases of laminitis.

Genetics is another area that has grown rapidly since 2000. Since the birth of the world's first cloned horse in 2003, followed by the full sequencing of the equine genome in 2007, researchers have been looking to see if they can identify genes that might make horses predisposed to diseases such as laminitis and certain types of colic. Treatments

Fortunately, therapeutic options for numerous conditions are available for horses, and new treatments continue to reach the market regularly. One noteworthy medication introduced over the past decade is diclofenac (trade name Surpass). A topical non-steroidal anti-inflammatory drug (NSAID) approved in 2004, diclofenac now gives veterinarians the option to localize treatment of osteoarthritis to a specific joint instead of administering broad, systematic treatment.

Another recent addition to the equine NSAID arsenal is firocoxib (trade name Equioxx). A non-steroidal anti-inflammatory agent like phenylbutazone (bute) or flunixin meglumine (Banamine), this oral medication came to the U.S. market in 2007 for use in treatment of pain associated with osteoarthritis. Noted for being less harmful to the gastrointestinal tract, firocoxib has given veterinarians another option when treating horses with OA pain.

Gastric ulcers have been in the spotlight for the past few decades as a potentially insidious cause of decreased performance and ill thrift. However, it wasn't until 1999 that GastroGard (omeprazole), the first FDA-approved ulcer medication for horses, became available. Since then, research continues on management strategies to help prevent the formation of gastric ulcers in horses. An understanding of the impacts that diet, exercise, and housing have on the health of the equine stomach is helping veterinarians better advise horse owners on how to keep their horses ulcer-free.

Stem cell therapy is a new biotechnology tool that researchers hope will be the next big thing for musculoskeletal injuries involving tendons, ligaments and even broken bones in horses. Sometimes referred to within the broad category of "regenerative medicine," protein-rich plasma (PRP) and interleukin-1 receptor antagonist protein (IRAP) are two other therapies similar to stem cell that can also help aid the healing process for orthopedic and soft tissue injuries. While there are no FDA-approved regenerative medicine therapies for horses available on the market yet, studies continue.

One treatment that is used widely now for tendon and ligament injuries is extracorporeal shockwave therapy (ESWT), which first came to the equine industry in the late 1990s. Electrically generated pressure waves have been shown to also help with navicular disease, bucked shins and small fractures, such as to the sesamoid bones.

Although equine protozoal myelitis (EPM) was discovered in the U.S. in the 1960s and at the time was considered rare, it is now the most common equine neurological disease in the country. Despite still being a challenging disease to diagnose and treat, advances in treatments over the past decade offer horse owners more than one FDA-approved option. The first, Marquis (ponazuril), was approved in 2001. Blood tests are more commonly performed today instead of collecting cerebral spinal fluid for diagnostics. Currently there are three FDA-approved EPM treatments on the market—Marquis, Protazil, and ReBalance.

Attempts in 2000 at an EPM vaccine proved ineffective, but new discoveries continue to shed light on this disease. While originally thought to be caused by mainly one species of protozoa, Sarcocystis neurona, new studies show a second protozoa, Neospora hughesi, is a more widespread causative agent than previously thought. Nutrition

Research in equine nutrition continues to show how important diet is to a horse's overall health, so much so that sometimes diet is now being used as part of treatment regimens for specific disease conditions.

One of the greatest examples of recent advances in equine nutrition is the development of the low-starch diet. Implemented for horses with insulin resistance and corresponding obesity, low-starch diets offer highly digestible fiber as the primary energy source instead of starch. These diets help regulate a horse's blood glucose levels, control weight and prevent the development of conditions such as laminitis.
Dietary supplements, although not new to the horse world, seem to be in a universe all their own today. Supporting gut health through the use of probiotics is an equine dietary niche that has seen continued growth over the past decade. Research on the gut microbes of horses has made veterinarians more concerned about gut health, especially when treating animals using antibiotics or those with chronic diarrhea. A more holistic approach to “treating the flora to treat the horse” has led to widespread use of probiotics in an effort to maintain an effective and healthy biodome within the horse’s gastrointestinal tract and improve the horse’s overall health. Joint Health

A myriad of joint supplements are on the market and range from oral dosages mixed in the feed to intramuscular (IM) and intravenous (IV) injections or intra-articular (IA) injections directly into an affected joint. In 2005, Legend (hyaluronate sodium) became the first approved IV injectable for treatment of non-infectious joint inflammation associated with OA. Many options exist for joint treatment, from nutritional supplements to intra-articular injections.

Senior Horses

Cushing’s disease, which primarily affects senior horses, has been better researched and understood in recent years. In 2011, a group of veterinarians and researchers called the Equine Endocrinology Group provided new recommendations to the veterinary community for differentiating between early and advanced stages of Cushing’s disease based on combinations of currently available laboratory blood tests. New guidelines are available on how to use combinations of tests to better diagnose and assess the disease.

In addition to the low-starch diet mentioned above, the treatment options now include Prascend tablets (pergolide), which in 2011 became the first FDA-approved veterinary drug for this disease. Prior to this approval, veterinarians had to use human pergolide in an extra-label manner for treating horses. Human pergolide was removed from the market in 2007 because of concerns of possible cardiac effects in humans. (Between 2007 and 2011, vets had to use compounded pergolide to fill the market void.)

Developments in disease control, diagnostics and treatments since 2000 have helped increase not just the lifespan, but also the quality of life for many horses. As veterinary medicine continues to move forward, our horses will continue to benefit.

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