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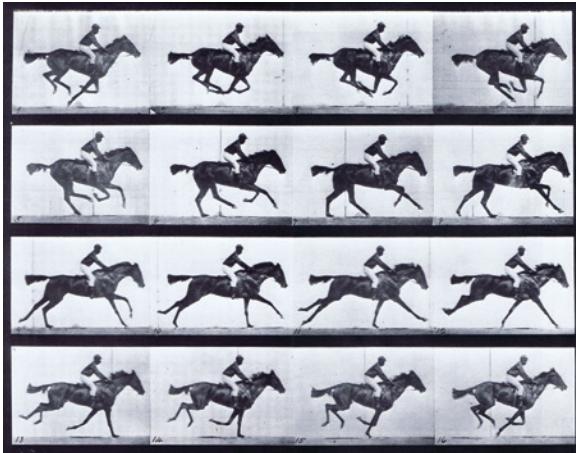
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Gone Away!

Jim shares his “slow and safe” approach to learning to ride your horse at the gallop.

Come to think of it, I have lived most of my life at the gallop ... the important parts, anyway. My first memories are of horses, and most of those memories involve speed. I have been lucky enough to spend my life with horses and done many different things with them, but the only times I feel truly comfortable on horseback are when I rise up off my four-legged pal's back, he breaks into a gallop and we head out into the country with a “let's see what happens next” attitude. Galloping in partnership with half a ton of living, moving, graceful, athletic creature gives me a thrill that I would never be able to get from a pet hamster.



Until 1878, horsemen argued about the mechanics of a horse's gallop. Some said the horse always had at least one foot on the ground while others said there was an instant when the horse had all four feet off the ground. An apocryphal story says that the photographs above were taken to settle a bet by business tycoon and former California Governor Leland Stanford, who hired a photographer named Eadweard Muybridge to take photos of a horse at the gallop. Sallie Gardiner, ridden at roughly 36 miles per hour by a jockey named Domm (his other names are lost to posterity), settled the question. You can clearly see from Muybridge's photos that Sallie has a period of suspension in her gallop. The photos were taken at the training track at Stanford's Palo Alto, California, horse-breeding farm, which is now the Stanford University campus.

Galloping Mechanics

I appreciate my horse's other three paces: walk, trot and canter. My father, quoting a U.S. Cavalry conditioning axiom, said that a rider should “walk for muscle, trot for balance and gallop for wind.” Each of these paces has its use, and certainly you can improve your horse's wind using the canter—but the canter and the gallop are distinctly different due to mechanics and velocity.

Mechanically speaking, the canter has three beats followed by a period of suspension. When we speak of a horse cantering on the left lead, for example, we mean that his left, or “leading” front

foot will touch the ground last. The sequence of footfalls for the left-lead canter is right hind foot, then left hind foot and right forefoot touching the ground at the same time as a diagonal pair, and finally, the left forefoot touching the ground, followed by a period of suspension. The scientific description of this suspended phase of the canter is called the “unsupported transition.”

In contrast, the sequence for the gallop is four beats followed by a period of suspension. Horsemen describe a horse as galloping on a “lead,” using the same characteristic as the canter: the lead is determined by the forefoot that touches the ground last, meaning that the left foreleg will reach farther forward than the right foreleg. The sequence of the footfalls of a horse galloping on his left lead will be right hind foot, left hind foot, right forefoot, left forefoot, followed by a period of suspension when all four feet are off the ground.

Before 1878, most horsemen believed that the galloping horse always had at least one foot on the ground. A photographer named Eadweard Muybridge used an early version of stop-action photography to prove that there is a period of flight—an unsupported transition—during the gallop. More than a century later, the London Royal Veterinary College followed up this early scientific research with a series of studies to determine the most efficient galloping position for the rider.

Thanks to science, we now have a more complete understanding of both our horse's movement at the gallop and of the galloping position that keeps us in the closest harmony with the horse.

Depending on your horse's individual paces and conformation, he will change from a canter to a gallop at about 600 meters per minute or about 20 miles an hour. According to some of the web



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The pulley rein is a very strong aid and should be used only in emergencies. To apply the left pulley rein, place your right hand all the way across your horse's neck. Simultaneously press your left hand straight down toward your horse's left shoulder and bring it straight back toward the point of your left hip. As your horse responds by slowing down, soften your reins as a reward for the correct response. Practice this in the arena at a slow rate of speed before you attempt it at the gallop and make sure you are equally adept with both hands.

sites I visited while planning this column, the top speed an equine can attain for a short distance is 44 mph. If you have been reading my columns for a while, you will know better than to believe everything you read, but you can comfort yourself with the knowledge that regardless of how fast you think you are going, you really are only traveling at about half the maximum possible speed of horses. Small comfort, for sure, but there it is.

Galloping Safety

OK, now you know what a gallop is—what's next? Because I want you to be safe and secure, we need to talk about your position before you actually gallop. But even before we talk about your position, we'll talk about using your head about your first galloping experience. If you have never ridden the gallop, then you should absolutely not borrow your

friend's 4-year-old off-the-track Thoroughbred and “take it for a little gallop” because in doing so, you will have created a potentially dangerous experience for yourself. Chances are, if you survive getting badly run away with, you will never again ride outside the confines of an arena.

If this is your first experience riding out of an arena or if in the past you have only trail-ridden at the walk, we need to take the “learning to gallop” process slowly. Your first galloping experience should be on a horse who can be kicked into a gallop but will slow down the moment you stop kicking. I'm not sure you should have another horse galloping with you at the same time because even placid horses can find galloping in company exciting. In that event you might find yourself involved in a spontaneous horse race, which is not the point of the exercise.

When I introduce you to the gallop, I will first make sure you are competent trotting and cantering around a large field. The hay field between my stables and my house is about 35 acres, and I have always found that to be sufficient. You might be the sort of rider with little

or no experience outside the confines of an arena and you have to be mentally adjusted before continuing the lesson.

Learn to Judge Your Speed

Find a suitable galloping area with enough room for the wider turns you will need to make as your speed increases over the next month or so. I am going to assume your field has excellent footing and is free of hazards such as rocks and groundhog holes because the quickest way to make a sound horse lame is to step in a hole or gallop him on bad footing.

Measure a 400-meter “speed trap” in your galloping area and put markers down at the beginning and the end of that measured distance. Make sure you can see the markers as you approach. (I use meters rather than yards or feet because most of the competitions I prepare riders for use metric measurements.) I set 400 meters as the beginning distance of my speed trap because it is a fast show-jumping speed and most riders will be comfortable cantering at this speed.

Pretty simple so far, right? But wait—although 400 mpm is not much greater than you are already used to, shorten



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I teach people to use a double cross also called a double bridge when they have to gallop a horse who takes a fierce hold of the bit. The “double” means that the rider has both reins in both hands. Adjust the reins to keep the distance between your hands to a minimum. To illustrate the technique, this rider has lifted her hands, but when you use a double bridge, place your hands firmly against your horse's neck. Once you establish that position, your horse soon discovers that he is pulling against himself, and most of the time he will relax and settle into a steady rhythm.



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The single bridge, or single cross, is easier to adjust than the double bridge. For that reason, I usually recommend this technique rather than doubling the reins. When you use the single bridge, you hold both reins in one hand and one rein in the other hand. Adjust the reins so that your thumbs almost touch. Here, the rider's hands have been lifted to illustrate the single bridge, but when you use it, place your hands firmly against your horse's neck. Make sure he is pulling against himself, rather than against you.

your stirrup length approximately 1 inch. You should be able to maintain your two-point position, where your seat is above but close to the saddle without resting your knuckles against your horse's neck for balance. With your stirrup leathers adjusted and with vertical stirrup leathers, test yourself at the halt: Rise out of your saddle as if you were posting at the trot, then pause at the top of that motion. Now cross your arms in front of you and keep your balance there for longer and longer periods of time without using your arms to steady yourself. This is more difficult for you to do than it is for me to say. I plan to spend several lessons preparing you both mentally and physically for riding at speed, and shorter stirrups will help you improve your fitness. You will find the shorter stirrups make your thighs and the small of your back become fatigued much more quickly than usual.

Once stirrups are set to the shorter

length, canter back and forth through your speed trap, noting the time for each exercise—400 mpm should take you one minute. You may have to train him to accelerate during this section instead of cantering.

Remember, learning to gallop faster is going to be a slow process. Once you can accurately canter through the 400-meter speed trap in one minute, measure a new speed trap with markers 450 meters apart in a different location in the field. Once again you will try to cover the distance in one minute. (You can see the progression I use to develop your ability to ride at speed.) Each time I ask you to go faster through the speed trap, shorten your stirrup leathers an additional inch (roughly an inch shorter for every additional 100 mpm, up to 600 mpm). The faster you gallop, the shorter you have to ride and the more you need to close your hip angle to stay with your horse's motion.

Chances are your horse will start to anticipate the speed traps and you

will have to train him to wait before he goes back through the faster speed trap. Try to stay ahead of him mentally as well as physically.

Using the Pulley Rein

Note that your horse will get fitter during this process and his increased fitness may reflect itself in his other activities. Horses who previously cantered around Baby Novice cross-country courses on a loose rein may wake up and take a keen interest in the sport. This can be fun, but you need to change your training practices as your horse changes. That's why I want you to know how to use a pulley rein because it is a very useful tool when you are having difficulty controlling your horse's speed.

If your horse is not listening to your usual aids to slow down, shorten your reins slightly, put your left hand all the way across your horse's neck in front of his withers and press your left hand down toward his right shoulder. At the same time, bring your right hand straight back toward your right hip. As your horse slows, make sure to reward him with soft reins so that he understands what you want.

I hope you will soon feel the joy that galloping produces. I enjoy everything about horses—training them in dressage, teaching them to remain calm and balanced during their show-jumping rounds and introducing them to their first water experience. But I find a complete sense of freedom only when my horse and I are gone away, galloping toward some invisible horizon. Each time he floats through the air, I am for an instant free from problems, free from critical coaches and unhappy people, free from flat tires and expensive truck repairs, free from the laws of gravity and velocity, free from earthly constraints. 🐾

For more galloping information, read additional columns by Jim "The Science of Galloping" and "Speed Magnifies Mistakes" at www.PracticalHorsemanMag.com.



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TICK TROUBLE

Learn how these disease-carrying insects can pose serious health risks for your horse.

By Elaine Pascoe with Linda D. Mittel, DVM

Your horse is plainly not himself. He's gone from perky to plodding in work and he flinches and pins his ears when you groom him. Last week he seemed a little off in front. That lameness improved, but now his hocks seem stiff. What's going on?

A tiny tick could be the cause of his problems. Ticks, blood-feeding relatives of spiders and mites, can transmit serious diseases through their bites. In this article Linda Mittel, DVM, senior extension associate with Cornell University's Animal Health Diagnostic Center in Ithaca, New York, helps explain what you need to know.

Horses are susceptible to two serious tick-borne diseases that are widespread in the United States, Dr. Mittel says—Lyme disease and equine granulocytic anaplasmosis. We'll cover both as well as equine piroplasmiasis, which is rare in the U.S.. Are there other tick-borne threats to horses? Maybe, Dr. Mittel says. The box on page 8 has an update on research into that question being carried out at the AHDC.

Ticks also transmit many illnesses (including Lyme) to people, dogs and other animals, so they are something to watch out for. These parasites have been around for at least 100 million years, long enough to have fed on (and perhaps spread disease to) dinosaurs. You won't be able to eliminate them from your horse's environment, but the box on page 9 has tips for protecting him from their bites.

Blacklegged Biters

Many kinds of ticks carry disease, Dr. Mittel says, but blacklegged ticks pose a serious danger to horses because they carry both Lyme disease and equine anaplasmosis.

Though many species of ticks carry disease, the blacklegged tick (or deer tick) is one of the most threatening to horses because it often transmits both Lyme disease and equine anaplasmosis.



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When grooming your horse, pay special attention to top tick-bite zones, such as the base of the mane. Tweezers are useful tools to remove ticks safely and efficiently.



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equine anaplasmosis. These ticks are widespread in the Northeast, Mid-Atlantic and Great Lakes regions, where they're commonly known as deer ticks, but they occur in pockets in the South and elsewhere. The West Coast variety is called the Pacific (or western) blacklegged tick.

Blacklegged ticks go through three life stages—larva, nymph and adult—and need a blood meal before molting from one stage to the next. They pick up disease-causing bacteria as larvae and nymphs by feeding on infected mice, and they can pass the bacteria on to their next victim, be it horse or human, dog or deer, or some other mammal or bird. The ticks overwinter in leaf litter and emerge again in spring or whenever the temperature is above 40° F. “Sunny days in the middle of winter can bring the ticks out to ‘quest,’ or look for a meal,” says Dr. Mittel. Because the ticks attach tightly when they bite and then stay in place, feeding slowly for days, the bacteria have plenty of time to move into the new host’s bloodstream.

Here’s more bad news: “The ticks are expanding their range,” Dr. Mittel says, potentially putting more horses (and people) at risk. The evidence comes from ecological studies as well as serology (blood tests) for infection with *Borrelia burgdorferi* (Bb), the bacteria that cause Lyme disease. “The infection prevalence determined by the serology shows more exposure to the Lyme organism,” she explains.

What’s behind the increase? Changes in landscape, climate and wildlife populations play roles. The ticks can’t travel far on their own; instead, they hitch rides on deer and other wildlife hosts. As deer and other hosts increase in number and move into new areas, the ticks ride along. They drop off and become established wherever they find conditions to their liking—for instance, former farmland that’s reverting to brush and forest or the shrubby borders of fields and yards. Researchers have noted correlations between warming climate trends and the ticks’ spread farther north. Warm winters are also helping them emerge earlier in spring and stay active longer in fall. That translates to greater risk of infection.

More Tick Trouble?

Lyme disease, anaplasmosis and piroplasmiasis are the only tick-borne diseases known to affect U.S. horses. But that doesn’t mean no others exist—only that none have been discovered and reported.

Blacklegged ticks harbor different species of *Borrelia* that may turn out to be associated with disease in horses, says Linda Mittel, DVM, senior extension associate with Cornell University’s Animal Health Diagnostic Center. And they’re not the only disease carriers—dog ticks, lone star ticks and other tick species carry various infections. In all, ticks are known to transmit more than a dozen diseases to people, including tularemia and Rocky Mountain spotted fever. “There have been no reports of these diseases affecting horses and horses may not be susceptible to the organisms that cause them. But with improved diagnostic tests, we may be surprised,” Dr. Mittel says.

Researchers at the AHDC are in the final stages of a multi-year project aimed at identifying other diseases that ticks may be spreading. Dr. Mittel says, “We have found potentially novel tick-borne infections in the horse that may be associated with fevers of unknown origins,” including various species of *Anaplasma* and *Ehrlichia*.



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Ticks, such as this engorged specimen, can present serious health risks to humans as well as horses.

Lyme Disease

Lyme disease is a serious threat to horses with long-term complications that can include chronic lameness and damage to the horse’s nervous system, heart and vision. The disease takes its name from Lyme, Connecticut, where it was first identified in the 1970s. It’s now the most common tick-borne infection in the United States—but, Dr. Mittel notes, infection doesn’t always lead to disease.

“Infection is the first step, when the ‘germ’ or agent enters the body,” she explains. Disease occurs when the agent replicates in the body, damaging tissues and producing signs. There are no national statistics on the incidence of Lyme disease in horses, but the increase in positive blood tests shows more exposure to the Lyme organism. “It would make sense that there is more actual disease, but reports are lacking,” she says. Statistics from the Centers for Disease Control show a steady increase in human cases.

Blacklegged ticks are tiny and gener-

ally drop off after feeding, so if your horse develops Lyme disease you may never see the guilty tick. How will you know and what should you do?

Signs: Vague and variable signs are a hallmark of this disease. They generally appear weeks after the bite and may include:

- Sporadic lameness, typically involving large joints, such as the fetlock, knee, hock or stifle, and often affecting multiple sites or moving from one site to another
- Lack of energy
- Behavioral changes, such as a sour or depressed attitude
- Hypersensitivity to touch or other stimuli
- Muscle soreness
- Low-grade fever
- Over time, chronic weight loss, leg swelling and other problems.

Most of these signs could be caused by a number of problems—even something as simple as overwork—and that makes diagnosing Lyme disease a challenge.

Diagnosis: The veterinarian will start with a physical exam and a thorough his-

Tick Be Gone

If you live in blacklegged tick country, take these steps to reduce your horse's risk:

- Apply fly repellents that contain permethrins, which can discourage ticks from attaching to your horse. Use these products whenever ticks are active—during early spring, fall and winter warm spells—not just when flies are bothersome.

- Groom your horse daily with special attention to top tick-bite zones like the base of the mane and tail and around the ears, throatlatch and belly. If you find a tick, use tweezers to grasp it



Disease-ridden ticks can hitch a ride on your horse, especially if you're traveling through the insects' natural habitat of thick shrubbery and long grass.

right at the skin where its mouthparts are embedded. Pull gently up to remove the tick and then kill it.

- Make ticks unwelcome in your horse's turnout space. Get rid of their favorite hangouts by keeping the grass mowed, clearing brush and trimming low branches.

The U.S. Centers for Disease Control and Prevention has more tips and information that can help you and your horse avoid tick-borne diseases (<https://www.cdc.gov/ticks/>).



Your veterinarian can perform a quick stallside test (the C6 SNAP) to diagnose Lyme disease. A blood sample will turn blue when positive, indicating the presence of antibodies to *Borrelia burgdorferi* bacteria, but will not reveal the level of antibodies or the stage of the infection. Further testing is usually needed for proper treatment.

tory to assess the horse's risk of infection. Then, if Lyme seems likely, blood tests may turn up evidence of infection. The simplest is the C6 SNAP, a quick stallside test that detects the presence of antibodies to Bb bacteria. It provides an instant result but doesn't tell much about the level of antibodies or the stage of the infection.

Laboratory ELISA (enzyme-linked immunosorbent assay) tests measure antibody levels with high levels (200–300 units and above) suggesting infection. This test doesn't always discriminate well between antibodies to Bb and those produced in response to certain related organisms, though. A Western blot test, which detects antibodies produced against certain proteins in the Lyme bacteria, is more specific.

While these tests have long been used to diagnose Lyme disease, they share two limitations. First, because the horse's immune system can take several weeks to produce antibodies to a new infection, tests run soon after exposure may yield false negative results. Second, because antibodies can continue to circulate long after the bacteria are gone, a positive test may just indicate past exposure to the bacteria, not active disease.

A multiplex test developed at the AHDC helps overcome the second limitation. It measures antibody levels, like the ELISA, while identifying different antibodies to specific outer-surface proteins of the

bacteria. Bb changes the expression of its outer-surface proteins depending on its environment, much as you might change clothes to suit the weather, so the presence of different antibodies can help determine if a Lyme infection is new or old.

For example, during initial infection the bacteria express outer surface protein C (OspC). "Antibodies to OspC are thought to develop about three to five weeks after infection and disappear within four to five months," Dr. Mittel says. Because OspC antibodies indicate recent infection, she says some veterinarians suggest treatment based on positive test results even if the horse isn't showing signs of active Lyme disease. The goal is to prevent the disease from developing, although the value of the practice hasn't been determined in horses. "The horse may not develop Lyme disease, so treatment would be unnecessary," Dr. Mittel says. However, she adds, "It may make sense to consider preventive treatment if the horse is in an area of proven tick activity and has been exposed."

Once infection is established, antibodies to a different protein, OspF, appear. "OspF may be present for a very long time—years in some cases—whether the horse is treated or not." A positive test for OspF, then, doesn't necessarily indicate active disease that must be treated.

Treatment: Most cases of Lyme disease respond to tetracycline antibiotics such as doxycycline or minocycline (both oral) and oxytetracycline (IV). "IV oxytetracycline is known to get the best blood levels in most of the body for Lyme disease," Dr. Mittel says. But IV treatment often means that the horse must stay at a clinic or have the veterinarian visit daily, which can be expensive. "Oral treatments do not achieve the same levels, but many veterinarians use the oral products and feel they see an improvement." IV treatment may be recommended if the horse doesn't respond to oral medication or relapses after treatment.

Although many horses show improvement within days of starting antibiotics, the bacteria won't be eliminated that fast. Treatment generally continues for 30 days



A spike in your horse's temperature (103–104° F) could indicate anaplasmosis, though a blood test is needed to confirm the infection.

or more.

Outlook: When Lyme disease is recognized and treated early, the outlook for recovery is good. Some horses suffer recurring attacks of Lyme disease, and it's not clear whether they are reinfected or are harboring the bacteria between attacks. In any case, the longer the disease goes untreated, the greater the risk of lingering effects and lasting damage to joints and other areas.

Neurological effects often take months to appear, although they have been reported anywhere from two to 730 days after infection. These effects are not common. But, Dr. Mittel says, "It is very difficult to confirm a diagnosis. Therefore, there may be more cases than are reported." The diagnosis is confirmed by examination of brain tissue after the horse's death.

Prevention: The best way to protect your horse from Lyme disease is to limit his exposure to the ticks that carry it. There is no approved equine Lyme vaccine and currently no effort to bring one to market. A canine vaccine is available and in high-risk areas some veterinarians give it to horses. No research shows that it prevents Lyme disease in horses, though. And while horses respond to the vaccine by producing antibodies, a Cornell study published last year found that the response is weak and short-lived.

Anaplasmosis

The bacteria that cause equine granulocytic anaplasmosis, *Anaplasma phagocytophila* (formerly *Ehrlichia equi*), take the same route as the Lyme bacteria—picked

up from mice or other small animals by ticks in the nymph stage and passed on when the ticks seek their next blood meal. As with Lyme, the risk is highest in the areas and at the times when the ticks are active—and as those areas and times increase, so do reports of the disease.

"More cases of anaplasmosis are being seen in horses," Dr. Mittel says. "We are getting positives in areas where veterinarians have not seen the disease before. Since ticks are often co-infected with *Borrelia* and *Anaplasma*, it appears that both agents are showing up in new areas." Sometimes ticks transmit both in the same bite.

Signs: Once in the horse's bloodstream, the bacteria attack white blood cells called granulocytes. Signs typically appear a week or two after a tick bite. They include:

- Fever, which may be high (103–104° F) for the first one to three days
- Depression and lethargy
- Loss of appetite
- Reluctance to move
- Swelling in the lower legs
- Muscle stiffness.

Older horses may be more severely affected. Dr. Mittel notes that any horse with a high fever and no appetite is at risk for serious problems, including dehydration and colic, so you should call the vet promptly if you see those signs.

Diagnosis: If the horse's history and physical signs point to anaplasmosis, blood tests can confirm the infection. A PCR (polymerase chain reaction) test detects segments of *Anaplasma* DNA; other tests check for levels of antibodies produced to fight the infection.

Treatment: The tetracycline antibiotics used to fight Lyme disease are also effective against anaplasmosis without the need for prolonged treatment. "Treatment with IV oxytetracycline often causes a very quick resolution of clinical signs—within 24 to 48 hours or even less," Dr. Mittel says. "Many veterinarians will treat anaplasmosis for two to three days IV and then switch to one of the oral tetracyclines, such as doxycycline or minocycline, for a longer course

of about seven days."

Outlook: With treatment horses generally recover promptly without lingering effects and they seem to develop a natural immunity that protects them from this disease for up to two years.

"Anaplasma has been reported to cause ataxia [incoordination]. I have had clients with horses that were unstable on their feet early in the disease, usually the first day," Dr. Mittel says. "In my experience these animals recover with no residual neurological signs."

Prevention: As with Lyme, there's no vaccine against this disease. Reducing exposure to ticks is the best defense.

Piroplasmosis

Equine piroplasmosis is considered a foreign disease in the United States, but it's endemic to Mexico and occasionally turns up north of the border. It's caused by parasitic protozoa (*Theileria equi* or *Babesia caballi*) that are harbored by various (mostly tropical) ticks and spread through their bites. The protozoa attack red blood cells, causing depression, fever, anemia and other signs. Piroplasmosis can be fatal, but it's often mild with few problems beyond weakness and loss of appetite. Some horses become carriers, showing few signs.

Outbreaks of piroplasmosis are reported to the USDA. Horses who test positive are quarantined and may be euthanized or shipped out of the country to prevent spread. In 2009 a large outbreak occurred on the vast King Ranch in southern Texas, affecting hundreds of horses. Scientists were able to identify cayenne ticks as the main vectors on the ranch. And the size of the outbreak gave them a chance to test what turned out to be the first effective treatment for piroplasmosis—a series of high doses of the drug imidocarb.

"There has not been an outbreak so large since," Dr. Mittel says. Several small U.S. outbreaks have involved the use of shared hypodermic needles or contaminated blood products, which can also spread piroplasmosis. The horses were racing Quarter Horses with links to Mexico, where the infection likely originated. 🐾