



LET'S LEARN SCIENCE!

Decoding Equine Scientific Research: GERIATRIC HORSE CARE

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Early on in my academic career, I accidentally acquired some skills in an area not traditionally taught as part of a degree program in the hard sciences: public communication.

I finished my doctorate in 2011, and social media was still a useful and (occasionally) pleasant tool for reaching out to a diverse cohort of folks who were interested in the finer points of the scientific research I was performing. Years later, I left my career in the academic and corporate sciences and started working horses instead. This decision turned out to be a good one, and while I missed the work to which I had dedicated almost two decades (as well as a healthier checking account balance), I recognized that my scientific training, while not directly related to the equine sciences, gave me a head start when it came to staying up to speed with equine research. As my equestrian career has progressed, my interests have naturally veered toward the more data-driven aspects of equine husbandry, biomechanics, anatomy, and physiology. (Tangentially, microbiology is my formal area of expertise, and so I can also be relied upon to be, very gamely, involved any time the vet needs to drain a large, satisfying abscess).

Research is disseminated throughout the scientific community via research articles, which are published in academic journals. These publications are designed to communicate the results of, often, very highly resolved topics which may or may not bring clarity to particles of a larger question. Papers generally comprise a synthesis of previous research and background, the design of an experiment, results, and then discussions and conclusions of the work at hand. The "discussion" portion of a paper is an interrogation, of sorts, of the project—and examines the limitations of the work, and what claims can be reasonably made as a result. Articles are reviewed by a panel of peers, and if accepted for publication, are included in a future issue of the journal.

The current model for scientific publication is, inarguably, deeply flawed, for reasons which are readily Google-able. This has been a topic of conversation since I was an undergraduate,

and there's no readily available solution. Most frequently raised is the issue of accessibility: scientists must pay to publish in journals. Many journals, in turn, charge a fee to anyone who subsequently wants to read a published article. This is deeply at odds with an academic research system which is largely publicly funded. If the public funds research, why should they pay to read the communicable output? This series of essays, however, isn't about tackling the inadequacies of the academic publishing industry.

It's about translating the extraordinary advances leveraged by equine researchers into day-to-day horse care. The major challenge associated with doing this successfully, is that scientific publications are incredibly *boring*. Student researchers have to learn how to read articles, there's a strategy employed to get through them, to scoop up pertinent information and to be discerning in analysis. Just because a project has been published—that's no guarantee of the quality of the science.

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In 2013, then UK Chief Scientist Sir Mark Walport famously addressed the Royal Society and said "Science is not finished until it is communicated." It's difficult for me to adequately describe how deeply I subscribe to this. Science is for everyone. The results of formal and informal scientific endeavors are for everyone, and should be performed on behalf of everyone. This essay and those that follow aim to gather up some of the recent advances in our understanding of equine research. I will do my best to translate and explain the broader concepts in a way that is palatable to those who aren't as enchanted by statistics and electron transport chains as I am—and explore how we might apply this information to our own equestrian practices. At the end of every article, I'll include a list of references which are all publicly accessible: you can do an internet search for the titles and immediately have access to the full article.

After running a quick poll with some of my friends and clients, it's clear to me that the majority of horse owners want



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to be informed and equipped with up-to-date information. Information that is supportive to our own equids, in addition to our community at large. Suggestions included the microbiome (my personal favorite), parasitology and deworming, genetic diseases, supplements, more detailed calls for discussion around suspensory issues, Pituitary Pars Intermedia Dysfunction (PPID), daytime forage bias, emerging diseases, and gait analysis. All excellent requests, which I hope to cover in the future.

For now, I'm going to present a review of some aspects of a topic which applies now to more and more equestrian custodians: effective and compassionate care of the geriatric horse. (You may be pleased to know that this first article is going to be more of a qualitative dive—but worry not, there will be plenty harder genetics, biochemistry, and biology to come.) We're all aware, I think, that due to extraordinary advances in veterinary medicine, equine nutrition, genetics and disease prevention, and improved general care, our horses are living longer. Horses might be considered "geriatric" after 15 or 20 years—but it is certainly not uncommon to meet one beyond his thirtieth year and in rude health. I've been lucky to work with many different demographics of horses, and I can categorically say I am always thrilled to work with the elders. There's really something special about being around a "been there, done that" senior.

That kind of embodied sensibility that we might find in the older ones, of course, is not necessarily defined by physical age. And technically speaking, medically classifying whether or not an equid is "geriatric," isn't either. While age is certainly an important variable, stage of life is also determined by general physical condition, and factors pertaining to environment and workload, such as whether or not the animal in question is an active athlete/competitor. Anatomically, any horse that has completed growth is considered mature, and this typically occurs by the sixth year. By the age of 11, when the cups in the teeth are no longer visible, horses are considered "smooth-mouthed." But aging is a continuous process, and because there is challenge associated with figuring out how old an unpapered, rescued, or adopted horse is, by necessity, we consider additional variables in order to classify stage of life.

A 2015 USDA survey found that geriatric horses account for 11.4 percent of the domestic horse population in the US—this represents a considerable chunk of large animal veterinary patients. Therefore, the research is backed by considerable experiential data collected by veterinarians as part of their day-to-day workload. Furthermore, most horse owners are prepared to expect age-related issues that should be monitored, for example, melanoma or arthritic joints. After 15 years of age, there is an increased prevalence of dental disorder. In 2023, a full ophthalmic survey of 50 horses ranging in age from 15 to 33 years (with a median age of 24) also found that 84 percent of the population was experiencing ocular pathology. By the age of 20, some 70

percent of horses require care for conditions related specifically to aging. Furthermore, acute or chronic injury or illnesses can make the difference between a horse who is classified as being mature, versus geriatric. Such problems include chronic founder and navicular disease, osteoarthritis, chronic gastro-intestinal problems, and PPID.

So—as custodians of older horses, we can anticipate specific challenges. What to do? One of the only scientifically validated methods to support healthy aging in horses is to keep them at a reasonable level of physical fitness. Maintenance of lean muscle helps prevent obesity, and aging is associated with low grade chronic inflammation, which is also exacerbated by a horse being overweight. Lean muscle mass also reduces insulin resistance. As horses age, they are more likely to experience lordosis (swayback), and so for this demographic, good saddle fit is extremely important if the horse is still being ridden. Aside from clear physical benefits, research has shown that keeping older horses in work appears to impact owner perception of the nature of care an older animal requires to stay well. Statistically, retired horses are less likely to receive regular preventative vet and farrier visits. In addition to fitness and nutrition, the scientific literature of the last few years supports, very strongly, the importance of routine preventative care far in advance of year 15 of a horse's life. This is, in turn, underlined by the importance of a consistent and effective relationship with a veterinarian—a luxury that is not accessible to all horse owners, due to an ongoing shortage in equine vets. Keeping good condition, of course, goes hand in hand with an effective strategy for nutrition. Research has shown a tendency for owners to respond to a loss of topline by overfeeding, or feeding inappropriately, e.g., too much protein. Overfeeding can, again, lead to unhealthy fat accumulation, if not matched by consistent exercise. Excellent commercial senior feeds are available, designed to provide older horses with everything they need, particularly if they are no longer able to chew hay. These feeds, which provide an appropriate range of micronutrients as well as protein and fat, play a key role in the promotion of healthy aging.

While most owners are clearly dedicated to the wellbeing of their equine charges, it would be remiss to discuss good practice in welfare without referencing the general epidemic of unwanted horses in the US. The American Association of Equine Practitioners (AAEP) coined the term "unwanted horse" in 2005, and Tom Lenz authored an excellent review of the issue in 2009. Many geriatric horses in the US are unwanted, and horse rescue organizations frequently and publicly discuss the pitfalls of trying to rehome seniors. Often, there is no soft-landing for high-maintenance elders. There is also an increasing interest in the welfare of seniors used the Equine-assisted Services (EAS) industry. In a limited survey of 30 participants, 60 percent of respondents reported that the senior horses used for their program were functionally lame, and that their level of pain

was largely (93 percent) determined by behavioral response. More research is needed into the welfare of older horses used in equine assisted therapeutic programs, and should be combined with ongoing efforts to support the general ongoing catastrophe of unwanted horses.

Survey-based research shows that owners are deeply concerned for and thoughtful about the wellbeing of their older horses. One of the greatest challenges we experience as loving owners is euthanasia, and assessing when it is appropriate to help our horses one final time. There are a number of quality-of-life indicators employed in the literature, and, in combination with your own understanding of how your horse behaves and feels, they may be useful in helping you decide when you're ready to plan end-of-life strategies. Consider appetite, and their body condition score. Do they still drink well? Particularly notice if they are able to lay down to sleep and if they can get up without prolonged discomfort. Research surveys have shown that firocoxib (Equioxx, Previcox) is one of the most common drugs administered by owners, and while older animals metabolize these similarly to youngsters, this class of drugs can cause gastrointestinal problems as a result of prolonged use. Is your horse comfortable without consistent use of pain meds? Additionally, and perhaps a factor overlooked in end-of-life considerations is social behavior. Older horses may experience suppressed emotional states, and become apathetic toward the humans and other horses around them. This is important to note in such highly socialized herd animals. Euthanasia can be a final act of fierce love, and it's worth having a discussion with yourself about the standards of living you hope for, for your older charge, versus whether it's enough that they stay alive at all costs. We are charged to consider how we might help them go on a good day, a peaceful day, or two weeks too soon, rather than one day too late.

For this article, I have only been able to skim the surface of the body of literature on this topic, and will be covering more in an upcoming online class on January 30th (please sign up and join us!). I hope it's been useful. To wrap up, for now, let's revisit the basics of what to track in order support the best health of senior horses. Be informed and considered in regards to appropriate fitness and nutrition, and be conscientious about your horse's weight and body condition score. Keep your older horses moving appropriately, and keep their minds active. Low-key proprioception work can be marvelous for the smart, but less mobile elder. Observe your horse frequently, and watch out for signs of an impending problem, such as quidding or choke. Be realistic about how much doctoring and management you can do on your own without veterinary input – for example, giving sore older horses prolonged doses of NSAIDs like flunixin (Banamine, Vetameg, Prevail), phenylbutazone (bute) or firocoxib (Equioxx, Previcox) can do damage to the gastrointestinal tract, leading to colic and ulcers. Be extraordinarily careful with

antibiotics. Regardless of how old your pony is, I implore you to consider the days of giving a handful of old SMZs you found in the feed room over. We'll dive into the topic of antibiotics to a greater depth very soon.

Until then, here's to the old, wise, bullish, funny, smart, sassy ones, and here's to all of you navigating the scope of every peak and trough that elderly horse care has to offer. Here's to all the best horses in the world.

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