



EQUINE HEALTH UPDATE

FOR HORSE OWNERS AND VETERINARIANS

Blanketing— Winter’s Hottest Debate!

By Dr. Camilla Jamieson MRCVS DACVIM,
Assistant Professor of Large Animal Emergency Medicine

In today’s equestrian world of the cutest blankets covered in snowmen and sloths, and TikToks of ponies being adorable in all sorts of matching sheets and wraps, it is very easy to spend a lot of time and money blanketing your horse. But is that always for the best?

The answer depends on a number of factors, and there is no absolute right or wrong. But, there are some guidelines that can help you decide when it is best to blanket, and when its safe and healthy to leave your horse to keep themselves warm. These factors are, primarily: how long your horse has had to adapt to the cold, how much winter coat they have, and how much precipitation/wind there is.

In the fall and spring in Indiana, when temperature fluctuations are dramatic and sudden, horses with thin coats, or clipped horses will often need a sheet or blanket to help keep warm. If your horse is in full work throughout the winter, and you have clipped some or all of their winter coat, then blanketing becomes a necessity. This is an important thing to consider before you clip as well. As soon as we as owners and



riders, take away the horse’s natural ability to thermoregulate, we have to take on additional responsibility to keep them warm.

Who needs to be clipped?

In short, horses with more hair than allows them to thermoregulate well. These, in general, are old horses with PPID (Pituitary pars intermedia dysfunction, also known as Cushing’s Disease), and horses who have grown a winter coat, but who are also being worked hard throughout the winter. If your horse is working to the point that they are sweating, through the winter, clipping can be important so that they don’t overheat during exercise, and also to allow you to bathe or groom the sweat

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WINTER 2023 / SPRING 2024

*Understanding the Challenges of
Winter and Preparing for Spring*



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Blanketing

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off effectively, and prevent chafing and skin infections from hair matting and sweat buildup.

Horses with PPID often do not shed well or fully in the spring, and/or grow an excessively long haircoat in the winter, which can mean that they need to be clipped for the spring and fall, so they do not sweat and suffer. However, this leaves them particularly susceptible to being chilled in sudden weather changes, especially as these are usually our senior citizen horses who do not thermoregulate as well as their younger herd-mates. One interesting fact about horses, is that their seasonal coat changes are controlled by a pea sized gland in the base of the brain called the pineal gland. The pineal gland responds much more strongly to changes in daylight hours per day (known as daily photoperiod) than it responds to ambient temperature. So, as the days get shorter, your horse will start to develop a winter coat, even if it has not gotten all that cold yet.

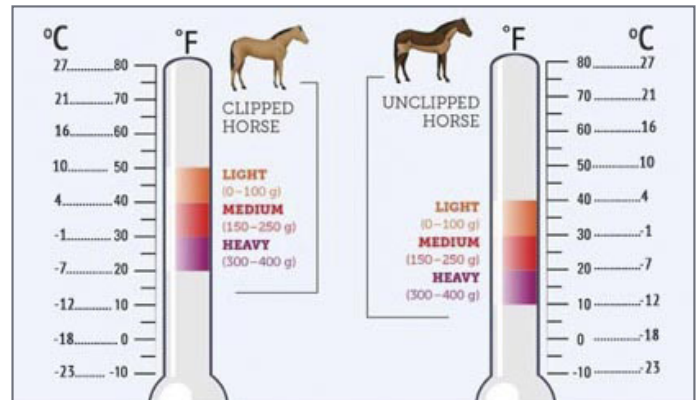
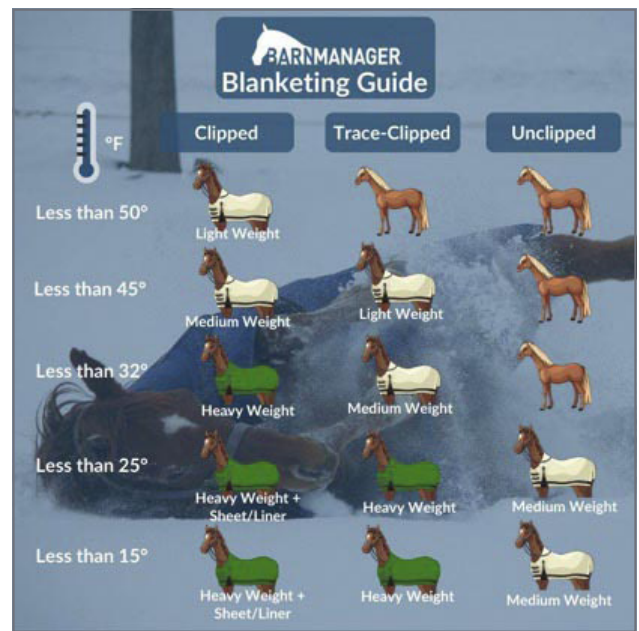
We asked our experts, and here is what they said about blanketing:

“During sudden dramatic temperature drops, if you clip your horse or want to discourage hair growth (which then you are committed to blanketing for the season), if they are old (23+) or young (foals), thin or not well, or if it is wet, especially if there is not an option for them to shelter themselves. I worked in Saskatchewan for 5 years and amazingly even with extreme temperatures horses adapt. Ideally, they would have a week or so of steadily declining temperatures to adjust, but most healthy, young horses adapt to the conditions and do not need to be blanketed.” – *Dr. Michelle Tucker, DVM, MS, PhD, DACVSLA, Assistant Professor of Large Animal Surgery*

“I blanket my horses when they look cold!” “No, but really, my horses are not worked hard through the winter, and they are all young, fit and healthy. I let them grow a natural coat, and they live out in a 5-acre pasture with 24/7 access to shelter. Once they have grown a decent winter coat, I will blanket with a waterproof, midweight blanket on the coldest wettest days, usually starting around Christmas time. It’s all very horse and situation dependent.” – *Dr. Amanda Farr, DVM, DABVP, Clinical Assistant Professor of Equine Field Services*

“You should blanket a horse if it has been clipped so does not have a natural winter coat and it is below 40°F. A horse with its own coat (not clipped) does not need a blanket, as a matter of fact, the blanket may crush down the natural insulating ability of their hair with air trapped in it. The fact snow doesn’t melt when it lands on a horse’s back illustrates how well their coat acts as an insulator.

Something I was told once that resonated with me is the fact that horses are temperate animals, they evolved in a colder climate. Humans are tropical animals—we take our tropics with us everywhere we go in the form of central heat. It’s



Images courtesy of Barnmanager + Horse Canada

hard for us to wrap our heads around the fact that temperate critters have adapted to accommodate cold and don’t mind it.” – *Dr. Janice Kritchevsky VMD, MS, Diplomate ACVIM – LAIM, Chief of Staff, Brunner Equine Hospital, Professor of Large Animal Internal Medicine*

What else can you do?

Keeping horses warm in the winter does not solely rely on blanketing. Digestion of forage, specifically digestion of structural carbohydrates, generates heat from within. For the average adult horse weighing 500Kg, the forage requirement increases for every 1°F of heat the horse needs to generate.

Feeding warm mashes of your horse’s regular grain can make you and them feel warm and cozy, however increasing forage feed (hay, chaff or hay cubes) is the most effective way to help your horse keep themselves warm. We do not recommend sudden feed changes, such as feeding a large mash of rice bran and sweet feed, to a horse who is usually on a different commercial feed.

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News & Notes

LIGHTS, CAMERAS AND ACTION!

Managing your Mare's Reproductive Potential and Setting up for Foaling Success

Dr. Justin Hayna DVM, Dipl. ACT, Clinical Assistant
Professor, Equine Theriogenology

As we head into winter, for many in the land of breeding horses it is a time of rest and relaxation. But this ends oh-so-soon. It is the perfect time to think about the next breeding season and the next set of foals that may be showing up early next year.

Mares cycle in the late spring and summer because they correlate the longer day lengths and increased hours of light with reproductive cyclicity and we use this to our advantage to manipulate this effect ourselves.

Who needs that pesky sun? For all your mares who are not pregnant, light therapy is a great way to get all your mares cycling early. The simplest way is to make sure you mares are exposed to 14-6 hours of continuous light/day. Unfortunately, it has to be for about 60 consecutive days. Light timers work really well to have your stall or barn lights stay on until at least 10PM. There are new ways to also do this using a lighted hood, which looks similar to a fly mask or racehorse blinkers, with a small bulb over the eyes to provide light to individual horses without leaving the lights on in the whole barn. These illuminated masks also work to manipulate the reproductive cycle of mares who are turned out at night/24 hours a day.

I generally tell people that once you've cleaned up from Thanksgiving and watched college football that Saturday to start the lights. Your mares will be cycling by Feb. 15 the next year. Plenty of time to get your mares checked out and ready to go, even if you do not want a January 1st foal.

Pregnant mares and stallions can benefit from this too by helping foaling mares cycle more reliably after birth and increasing sperm counts in stallions. Combine all this with some cameras in your barn to watch for the next foal crop that always seem to show up at 2AM in the middle of a storm. Once you have all the lights and cameras on, hopefully you won't miss any of the *action!*

If you are thinking about breeding your mare, or have any questions about mare, stallion or foal management, don't hesitate to give us a call at the Brunner Equine Hospital, and talk to Dr. Hayna, or book an appointment to come and discuss your breeding needs in person!



Blanketing (continued from page 2)

Many horses prefer warm or body temperature water, and drinking enough water is essential for healthy, effective digestion and preventing impaction colic. While offering warm water doesn't directly warm your horse's core body temperature (the volume they drink is too small to affect their overall body temperature), offering warm water can encourage your horse to drink more, in turn helping them to generate more heat via more efficient digestion, as well as keeping their gastrointestinal contents and their body hydrated and healthy, preventing some types of impaction colic.

Providing shelter from the wind, rain and snow, turning off fans to reduce air movement, closing windows and doors to barns to reduce wind and keep in heat generated by horses can all help to keep horses warm and dry, with or without blankets.



Retained Placentas: Disease Process and Treatment

By Aaron Lorenz, , DVM Student (Class of 2024)
Edited by Dr. Camilla Jamieson

One major concern in equine reproduction is the issue of retained placentas. This is an issue that not only threatens the health of the mare, but also her ability to be rebred

later. This article will briefly discuss the physiologic process behind a retained placenta, some things that may cause a mare to be susceptible to developing the problem, and several different ways retained placentas can be treated. In a normal parturition, or delivery, the 1-2-3 rule is commonly used to help owners, staff and vets keep track of important timepoints, to ensure mare and foal are progressing normally. The 1-2-3 rule refers to the key events: the foal should stand by 1 hour postpartum, nurse by 2 hours postpartum and the mare should have passed her placenta by 3 hours post-delivery.

In a normal expulsion of the fetal membranes or placenta, a multi-step process must take place. When the umbilical cord is ruptured, pressure within the blood vessels of the placenta drop dramatically, and the vessels themselves collapse causing the microvilli within the endometrial crypts (the part of the placenta holding it embedded into the uterus) to recede. Invagination of the chorioallantois then begins within the horn of the uterus that the fetus was located. The continued uterine contractions and abdominal compressions contribute to expulsion of the membranes from the uterus. Finally, the weight of the membranes themselves creates a gentle traction to assist in removal. If any parts of this process are interrupted, the placenta will likely be retained for an extended period of time. The most common physiologic step that is interrupted is the detachment of chorionic villi from the endometrium of the mare.

There are numerous presentations that can predispose a mare to retained placenta. Some of these include dystocia or difficult birth, especially if it results in a C-section, hydrops presentation, or a prolonged pregnancy. Additionally, low calcium concentrations decrease uterine contractions thus leading to retained placentas. Finally, decreased oxytocin receptors in the placenta, or decreased oxytocin release that should be stimulated by nursing can cause retained placenta due to decreased uterine contractions. If the placenta remains 3 hours past birth, it is considered a retained placenta. Retained

placenta is potentially life threatening to the mare and should be treated immediately. If no treatment is pursued, the mare is at high risk of developing metritis and subsequent endotoxemia as well as laminitis.

The first step in treatment is confirming that the mare has foaled and there isn't a second fetus/twin present in the uterus. Next, multiple different options of treatment need to be considered. One option is administering 10-20 IU of oxytocin every 2 hours intramuscularly. The goal of this is to stimulate uterine contractions to assist in expulsion of the placenta. Next, one can use the concept of simple traction. This can be done manually or by tying a partially filled jug to the membranes to apply gentle steady pressure to the tissues to slowly separate the attachment over time. However, one must be careful not to apply too much force and tear the tissues. The Burns technique can be implemented by filling the chorioallantois with tap water or saline. Again, the idea here is to apply gentle traction. However, the stretching caused by filling the membrane also induces release of oxytocin in the mare which will hopefully aid in uterine contractions. In order for this technique to work, the chorioallantois must be completely intact. Finally, one can also use the "Dutch" technique. This is similar to the Burns technique in that you use distention with water; however, the umbilical vasculature is used rather than the entire chorioallantoic membrane. A small incision is made into the umbilical artery or vein and a catheter is placed into the vessel. The catheter is attached to a shut off valve which is then connected to a water hose. The valve is slowly opened, and water slowly fills the vessels causing distention and attachment breakdown at the micro-cotyledonary level.

Although a relatively uncommon post-parturition issue to have in horses, retained placentas are a very serious issue threatening the health and production of a mare. This should be treated quickly in order to prevent further sickness with the mare.

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News & Notes

PERFECTING THE TIEBACK

A Precision Approach to a Traditional Procedure

By Drs. Michelle Tucker and Camilla Jamieson

Laryngeal hemiplegia, or “roaring” is an age-old complaint that has significantly affected Thoroughbred racehorses and other performance horses for decades, causing poor performance, horses that wind easily, and complaints of excessive noise from jockeys and riders. It is a neuromuscular problem in which part of the larynx, the arytenoid, collapses when the muscle that controls it becomes paralyzed and stops pulling it open. The most commonly performed surgery to correct this issue is known as the “tieback”, or prosthetic laryngoplasty; a procedure in which a suture is placed to help open up the airway and regain the horse’s normal airway function. Perfecting this surgery to optimize performance has been a strong focus of research for equine surgeons, who have looked at both the type of suture used and other fixation devices, to improve post-surgery performance, and reduce the chances of side effects after surgery.

Our own Dr. Michelle Tucker is taking a different approach. Using her background in engineering, she hopes to evaluate the breathing mechanics in horses and how they are affected by different levels of tension in the suture of the tieback surgery. In the past, 3 levels of suture tension were explored in one horse head model, which has been the model used for surgical recommendations since. The technological advancements since that report could help surgeons better understand the impact of laryngeal hemiplegia and the tieback on a much deeper level.

Here at Purdue, Dr. Tucker is working to shed more light on this subject in the new Brunner Equine Hospital. It has a unique computed tomography (CT) machine that allows the affected areas of the horse’s throat to be imaged standing (below). This will allow her to perform surgeries on sedated but awake horses using local anesthetic, and then to CT them to better understand how the airway area changes with different levels of tieback tension. The benefits of CT in addition to traditional endoscopy for evaluating roaring horses is that the veterinarian obtains a 3-dimensional image of all affected tissues, including nerves, muscles, and cartilage, and allows them to plan a personalized and unique surgery for each individual horse.

CT images are currently used in human airway surgery to build computational models for in-depth three-dimensional analysis of how air moves through the upper airway.



Horse in the standing CT.

The end goal of Dr. Tucker’s research is to be able to build virtual models of each horse who requires a tie-back surgery, to evaluate the impact of surgery on airflow mechanics. The complex geometry of a horse’s airways lends itself to a very complicated airflow model, which is where computational fluid dynamics, or CFD, comes in. CFD is a technique that allows researchers to evaluate changes in airflow and pressure within small regions of the airway, highlighting regions that may collapse or cause issues with future performance.

Combining all of this together, one of the big questions that Tucker hopes to answer is: ‘how much tieback abduction is enough?’. Abduction is directly related to the suture tension mentioned above. She is currently conducting a study to compare different levels of arytenoid abduction in the CT images of awake horses from a CFD standpoint to determine the effects of airway surgeries through the larynx and which level of abduction is the best for each of the horses, to optimize their outcomes and post-surgical performance.

What to Expect When Your Mare is Expecting?

By Ashlee Bourquin, 2024 DVM Candidate
Edited by Dr. Camilla Jamieson

Breeding horses and managing broodmares is very popular in the world of horse owners today. Knowing what to expect and how to handle challenges that arise will help you to be prepared and will increase the chances of success and safety. In this article, we will discuss the different stages of parturition, birthing problems, and useful tips for horse owners to know.

A Protected Pregnancy:

Gestation refers to the time it takes for the foal to develop from breeding until birth. In mares, the length of gestation is approximately 340 days, but can range anywhere **from 320 to 380** days. In gestation, it is important to make sure that the mare is up to date on all vaccines prior to breeding/conception, and boosted prior to delivery, to reduce the chances of the foal being infected while still inside the mare, and to make sure that the mare's colostrum contains the highest possible concentration of protective immunity. Mares should receive a killed Equine Herpesvirus-1 vaccine at 3,5,7 & 9 months of gestation to prevent herpesvirus pregnancy loss, and at the 9 month vaccines, have all her core vaccines (EEE/WEE/WNV/Tetanus/Rabies) and any regionally important vaccines, boosted. In Indiana, Potomac Horse Fever vaccination is strongly recommended, and botulism and rotavirus should be discussed with your vet to decide if these are necessary for your mare and foal.

Predicting Foaling:

Assessing behavioral changes in your mare as delivery approaches is important because significant changes can indicate that the mare is about to foal. Some common signs that indicate your mare may be close to labor include relaxation and swelling of the vulva, signs of restlessness, and frequent urination. Leading up to parturition, the mare's udder will also become enlarged, and she will start "waxing" which means that there will be waxy accumulations on her nipples.

Prior to foaling, it is important that you set up a large stall, preferably away from other horses for your mare to have her own space. In addition, the stall should be bedded with clean straw so that it provides a clean, soft place for parturition to occur. Parturition, or foaling, is the act of a mare giving birth to foal. In horses, there are three stages to this process.

In the first stage of labor, the mare will be restless, sweating, swishing her tail, biting at her sides and may even show signs of colic. These behaviors are seen because the foal is moving into position to prepare for birth. It is important to make sure that the mare is in a quiet environment because if she feels threatened, then she can prolong this stage of labor. You will know when stage one labor ends and stage 2 labor begins because clear fluid will be released from the mare's vulva which is commonly referred to as "water breaking." Stage one should last no more than 12 hours, so if it is taking many hours to progress then this could mean that something is wrong.

Stage two of parturition refers to the actual expulsion of the foal from the mare, and should never take more than 30 minutes. In

this stage, the mare will have very strong contractions. Hopefully the foal will be in proper alignment with the mare to ensure a smooth delivery. Malalignments of the foal are one of the most common issues for mares and will most likely need veterinary intervention. If 20 minutes or more have passed, from the time your mare's water has broken and the foal is not delivered, call your vet immediately. Having a veterinarian present or available by phone would be extremely beneficial just in case any complications arise. Stage two will end once the foal is out.

Normal foals should follow the 1,2,3 rule. This rule states that a foal should be standing one hour after birth, nursing 2 hours after birth, and passing meconium, or poop, three hours after birth, and the mare should have passed her placenta by 3 hours. If the foal does not seem to be acting right, don't hesitate to call your veterinarian to make sure that everything is going smoothly.

The final stage of parturition for the mare is expulsion of the placenta. If this does not occur by 3 hours post-partum, this is a significant enough complication that it warrants its own section of the newsletter!

Once parturition is complete, there is still much to do. Routine veterinary visits for both the mare and foal will help ensure that they are both in good health and are up to date on necessary vaccinations. Careful monitoring of the mare, prepping a suitable foaling environment, and having knowledgeable resources to turn to, can create more positive foaling experiences for horse owners. Not only will these experiences be positive for the people involved but they will also be positive for the mare and foal. Remember that unexpected situations and complications can always still occur so don't hesitate to consult your regular veterinarian or any of the specialists at Purdue Veterinary Hospital if you have any concerns or questions throughout the process.

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A Look Inside the Gift Horse's Mouth: The Importance of Equine Dentistry

By Andy Pietraniec, 4th Year DVM Student — Edited by Dr. Camilla Jamieson

Excellent dental care is the first step to good gastrointestinal health, maintaining optimal body condition scores, and keeping horses performing their best, especially in the winter when most of the diet is forage which requires good breakdown in the mouth to start the digestive process well. To understand why it is important to keep a horse's mouth healthy, it is important to understand a bit of the anatomy inside the mouth, and how the teeth behave as the horse ages. Horses have hypsodont teeth which means that the crown of their teeth is much taller than species that have brachydont teeth such as humans, dogs, and cats. Hypsodont teeth continue to erupt throughout the horse's life, which is essential to maintain oral health throughout the lifespan of a horse. This type of teeth allows animals that feed on rougher forage to grind and break down their feed rather than rely on ripping and tearing their food apart. In the process of breaking down their feed, they also slowly wear down the tops of their teeth. A horse's permanent teeth are about 4 inches long, and as they wear their teeth down during the year, new tooth crown will come up from the jaw to replace it at a rate of 3-4mm per year. That means that by the time all the horse's permanent teeth come in by 5 years old, their teeth should continue to erupt and replace what is lost until they are almost 30 years old.

As horses have become domesticated, humans altered their diet to contain more grains and concentrated nutrients instead of horses eating only what they can forage around them. While this can help ensure a more well-rounded consistent diet in all types of environments, it also means that horses spend less time grinding and breaking down their food since it is much more easily digestible. Therefore, teeth do not always continue wearing down and regrowing in a perfect pattern, and that is where we start to see issues. Enamel can wear down to sharp points that are painful to the soft tissue of the cheek and can cause ulcers. Teeth can become fractured and painful and the surrounding soft tissues become swollen. Teeth can be worn down unevenly, changing the conformation of the surrounding teeth and mouth. Food can get stuck in diastemas (gaps between teeth) in the mouth, allowing bacteria and other infectious agents to grow and infect the mouth. These are all things that can cause harm to the horse's dental health and could affect its behavior too. Some common signs of a horse with a dental issue are evidence of trauma to soft tissues in the mouth, pain when chewing, issues with bits when riding, foul smelling odors coming from the mouth, facial swellings with or without draining sinus tracts, dropping partially chewed pieces of feed (also called "quidding"), seeing large undigested feedstuffs in their feces, and losing weight. If you start to notice

these clinical signs, it is important to get a veterinarian out to do a thorough examination on the horse and see what the issue is.

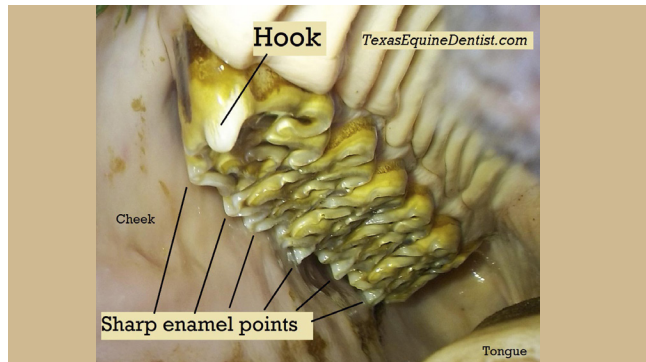
But what if you never see any of these clinical signs? Does that mean you do not have to worry about your horse's oral health? While there may not be an evident problem that is manifesting from an oral lesion or disease, that does not mean there isn't a problem brewing that needs to be addressed. Just like with people, preventative dental care with horses is an important way to prevent pain and infection in our 4-legged friends. Between the ages of 2 and 4, most horses should get twice yearly oral exams since this is when a lot of baby teeth are being replaced by new permanent teeth, and issues at this point could have long lasting negative consequences on the mouth if left unattended. On the opposite end of the spectrum, older horses are also more susceptible to issues with their teeth and gums since the teeth are nearing the end of their wear down and regrowth cycle. The teeth can become loose and more easily form pockets with impacted feed that can lead to infection if left untreated. It is important to work with your veterinarian to set up a working schedule for future dental rechecks as needed for each individual animal. Some horses may go as long as 2-3 years between checks if their teeth seem to be in great condition, while others may be put on a schedule of once a year or sooner if their mouth is a repeat offender for some of the issues listed above.

Formal veterinary training of equine dental care started back in the 1800's and has been advancing ever since. Dentistry as we know it today really took shape in the 1970's and continues to advance year after year. Recent advancements have been focusing on improving techniques and tools around endodontics, which is all the blood vessels, nerves, and connective tissue beneath the hard exterior of the tooth that is hidden in the dental pulp. Nowadays there are equine dentistry specialists that can perform procedures like root canals and dental fillings for more valuable horses that fit certain criteria for these procedures. This provides an alternative to simply removing "problem" teeth, potentially allowing the horse to keep a more normal dental composition which can be aesthetically pleasing. These specialty procedures can either be done under standing sedation or general anesthesia, depending on their complexity and duration. Complex, finesse procedures like these used to be near unthinkable and unreasonable to do routinely on a horse, and now they are commonplace in some areas of the world. Who knows what sort of new advancements we will have in the world of equine dentistry in the next 20 years.

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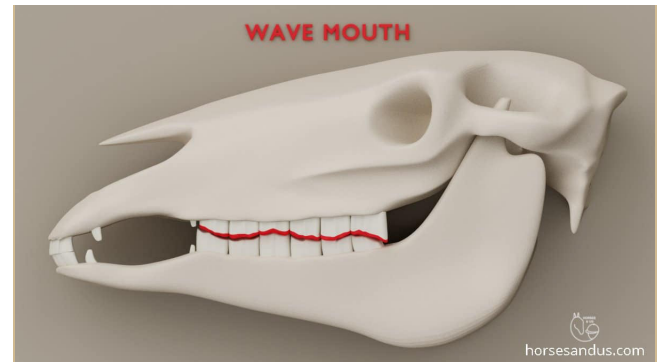
Common Terms Associated with Equine Dentistry *(continued from page 7)*

Points—
sharp enamel overgrowths



<https://www.texasequinedentist.com/blog/2012/11/before-and-after-photos-of-a-7yr-old-barrel-horse/>

Waves/Wave Mouth—vertical misalignment of the molars when the jaws are closed together



<https://www.horsesandus.com/common-horse-teeth-problems/>

Cupping—enamel begins to wear away and become level with the gumline



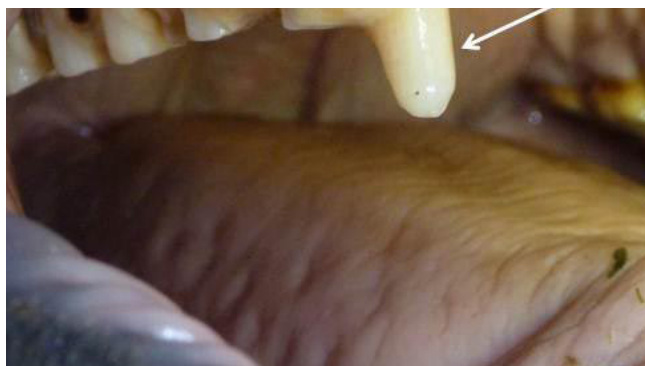
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Diastema—
a space between two adjoining teeth



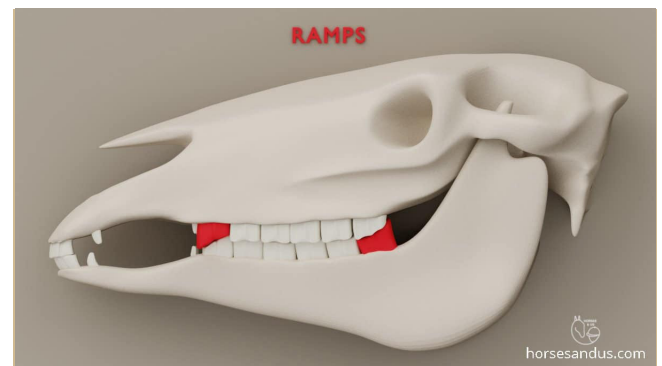
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Hooks—a sharp edge that forms an overhang in the mouth front or back



<https://www.texasequinedentist.com/blog/2013/05/equine-dentistry-hooks-2/>

Ramps—
excessive height to lower premolars



<https://www.horsesandus.com/common-horse-teeth-problems/>

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EQUINE WELLNESS FORUM

COLLEGE OF VETERINARY MEDICINE

Join us for the annual Equine Wellness Forum, which will be held Saturday, February 10, 2024. This event is designed to inform horse owners and equine industry professionals about horse health issues ranging from basic preventative healthcare to the latest medical advancements.

The all-day seminar is scheduled from 8:30 a.m. to 4:30 p.m. and will begin with a welcome and introductory remarks by the head of the Department of Veterinary Clinical Sciences, Dr. Catherine Scott-Moncrieff. She will be followed by a series of special speakers addressing a range of topics.

<http://vet.purdue.edu/ce/equine-wellness/index.php>

The Equine Sports Medicine Center

Purdue's Equine Sports Medicine Center is dedicated to the education and support of Indiana horsemen and veterinarians through the study of the equine athlete. The Center offers comprehensive evaluations designed to diagnose and treat the causes of poor performance, to provide performance and fitness assessments, and to improve the rehabilitation of athletic horses. Other integral goals of the Center are to pioneer leading-edge research in the area of equine sports medicine, to provide the highest level of training to future equine veterinarians, and to offer quality continuing education to Indiana veterinarians and horsemen. For more information visit our website:

<https://vet.purdue.edu/esmc/index.php>



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EQUINE HEALTH UPDATE



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