



How Blood Circulation Impacts Your Horse's Health

Horses are among the most impressive athletes of the animal kingdom, something that is particularly impressive given their massive stature. In order to perform at such a high level, horses rely on a specialized circulatory and robust respiratory system to cycle intensively massive amounts of blood in order to keep all their tissues well oxygenated.

Maintaining a healthy circulatory system isn't just important for performance and endurance, but for the body to be able to heal and repair after exercise. Good circulatory health is important for all horses, of course, though the demands are greater in sport horses. That's why it's paramount to be at least broadly aware of how your horse's blood circulation functions, and what you can do to help maximize its blood flow for a healthy, happy life.

An Overview of Equine Circulatory Systems

The basic principles of blood circulation aren't too different from ours. Their hearts pump blood through the arterial and venous system to provide cells with the oxygen and nutrients needed to perform. However, a horse's circulatory system differs from human's in a few key ways:

- Size of the heart relative to body weight
- How the spleen affects performance and recovery
- What role hooves play in blood flow

- Importance of sufficient lymphatic drainage, especially in lower limbs

On average, the human heart makes up only about 0.3% of total body weight. Meanwhile in a Thoroughbred horse, their hearts can make up over 1% of their total mass. This is no coincidence in relation to their endurance ability, as the average adult horse has approximately 35-40 liters of blood to circulate through their massive bodies. And with a heart rate that can vary as low as 30 beats per minute at rest up to 240 bpm at full gallop, you can see why they require such massive pumping power.

A horse's spleen performs the same role in the immune system by filtering and removing damaged or diseased red and white blood cells from circulation. However, in keeping with the theme of "bigger is better," they have a huge capacity. When the horse is at rest, the spleen will expand to hold up to 1/3rd of the horse's blood, slowly filtering through before re-entering circulation.

Under high levels of excitement or exercise, the spleen will contract, releasing nearly 85% of that stored blood into circulation, greatly increasing usable RBC count to transport enormous amounts of oxygen to the muscles. This nearly doubles the oxygen carrying capacity of the bloodstream in mere seconds, giving the horse the potential to release massive amounts of energy over extended periods of time.

Horse hooves have a very interesting mechanism for pumping blood back through the venous and lymphatic system on the long way back to the heart. This system is needed, given the hooves position relative to the heart and long distance the blood has to travel, as well as the fact that a horse's legs lack the required musculature to aid in blood flow.

This pumping mechanism works through a network of veins called the venous plexus, which are compressed by the lateral cartilages and the coffin bone against the hoof capsule in order to push blood up the leg and back to the heart. This compression happens naturally as the horse bears weight down on that limb.

What Can Be Done to Aid Blood Circulation?

So with the unique aspects of equine blood circulation, there are some regular routines (beside movement- icing, hosing, poultice etc. What every horse person knows) and habits that are a good idea to get into with your horse to promote good circulatory and overall health and happiness.

Regular exercise:

The most important thing for your horse's circulatory system is regular intervals of healthful exercise. This is especially true given the importance of the horse's hooves in providing efficient blood flow. Getting their heart pumping and muscles contracting regularly trains and builds up the circulatory system's ability to properly deliver oxygen and nutrients to all the far reaching tissues of the body.

Now the next time you're completing a cross-country course, performing a dressage test, or just going for a weekend trail ride, you'll be equipped with the knowledge needed to keep your horse at its healthiest and happiest, aided by healthy blood circulation and recovery.

Relaxation:

On top of the importance of rest to give your horse's body time to heal and repair all the muscles that were worked in their previous workout, this rest gives the spleen time to expand and more efficiently do its job of filtering the blood. Continual stress or excitement without time to relax can greatly impede this process by causing the spleen to contract again. Time is well spent bathing, brushing, and massaging to aid this process, as well as time to wind down in an open field.

Given that sport horses don't often have much time between shows, having time to relax is critical to your horse performing its best. The more you can do to aid their relaxation during this time the better!

Keep your horse cool:

When working under hot conditions, blood vessels under the skin and in the lungs expand in order to provide maximum surface area for cooling of the circulatory system. This works in conjunction with your horse's sweat and cool, fresh breaths of air to regulate their body temperature under high heat stress. The byproduct of this, however, is that more blood is occupying these areas instead of circulating through the system. This is important to keep in mind equally in a hot horse trailer as it is when making your way along a trail on a hot day.

Groom and massage your horse:

While regular grooming is of course hygienically important, removing dirt, shed hair, and dead skin cells, it also stimulates good blood flow under the skin. This increased circulation helps promote a healthier coat. Regular massages benefit the skin as well as the muscles underneath, helping with recovery, relaxation, as well as helping to keep the skin normally under the saddle healthy and free of sores. This can be done with your hands or by a professional equine massage therapist. If you're massaging them yourself, of course be sure to watch your horse's body language for what feels good and what doesn't.

Regulate inflammation and healthy circulation through diet:

Nitric oxide, for instance, is an important signaling molecule in the body, acting as a vasodilator. Nitric oxide signals the smooth muscles along the internal lining of the blood vessels to relax, opening up the vessels to increase blood flow capacity.

Help improve microcirculation with Bemer PEMF therapy:

The Bemer equine therapy blanket and cuffs use PEMF (Pulsed Electro Magnetic Field) technology to stimulate the smooth muscle tissue in your horse's microcirculatory system. This helps to aid blood flow at the tissue level to promote quick regeneration, allowing red blood cells to deliver oxygen and nutrients and helping to remove cellular and metabolic waste.

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