

Prehabilitation Before Surgery

Your horse's recovery from surgery should start long before heading to the OR

Bandage changes. Incision care. Stall rest. Medications. Vet rechecks. Hand-walking. Tack-walking. Sedation to “take the edge off.” If you’ve ever guided a horse through the recovery and rehabilitation process post-surgery, you know it’s hard work. The journey of rehabbing an equine athlete back to his former abilities after surgery can be incredibly rewarding but also frustrating—and even dangerous—at times. Luckily, new research and technology are emerging, guiding equestrians toward a better, safer, and more effective way to approach rehabilitation from surgery that

starts long before heading to the OR: It’s called prehabilitation.

Rehabilitation vs. Prehabilitation

What’s the difference between rehabilitating and prehabilitating your horse, besides the “p”? The prefix re means “again,” of course, while the prefix pre means “before.” Habilitation, in the context of physiology, refers to the process of becoming fit for a particular purpose. Therefore, prehabilitation is done pre-surgery to help maintain the patient’s fitness post-surgery. The goal of prehabilitation is not to replace either

rehabilitation or the surgery itself. Rather, the American College of Surgeons describes prehabilitation as “a process of improving the functional capability of a patient prior to a surgical procedure so the patient can withstand any postoperative inactivity and associated decline.” In humans this essentially consists of optimizing physical fitness, strength, and mobility to balance out the losses caused by immobilization and inactivity postoperatively.

With horses, we face the additional challenge of behavioral complications that stem from not acclimating to varying triggering stimuli before surgery. By nature, these animals are not designed to handle the lifestyle associated with surgical recovery—one of confinement and restricted movement.

“In my experience, many horses have trouble after surgery adjusting to life without work and without any exercise, even when temporary,” says Lauren Schnabel, DVM, PhD, Dipl. ACVS, ACVSMR, associate professor of equine orthopedic surgery in the Department of Clinical Sciences at North Carolina State University (NCSU) College of Veterinary Medicine, in Raleigh, and the co-founder and chief medical officer of Vetletics Inc. “This (period of stall rest) sets them up for anxiety, stall vices, and often unpredictable behavior that is dangerous to both themselves and their caretakers.

“Additionally, many horses do not readily accept certain types of bandages, rehabilitation equipment, and rehabilitation exercises, especially if the first time they encounter them is postoperatively, when they are uncomfortable and in pain,” she continues. “They may kick out with the bandaged leg or stomp with it or chew at the bandage, none of which are desirable postoperatively



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A dry treadmill provides controlled exercise on a firm, level surface in a straight line to help correct compensation patterns.

and could prevent healing or lead to further injury. Worse, these horses may kick out at equipment or the person performing the therapy or exercises if they are unfamiliar with them and also nervous or painful.”

In other words, the recovery period after surgery is not the ideal time for novelty in your horse’s routine.

“In fact, you even slow down the rehab progress by waiting until after surgery to habituate the horse to their rehab routine,” says Katie Hawkins, BA, MA, an FEI-permitted and certified equine massage therapist (CEMT) and certified equine rehabilitation therapist (CERT) who runs Unbridled Equine LLC, an equine massage and rehabilitation business in St. Charles, Illinois. “Even just a few weeks of prehabilitation before surgery pays dividends. If the horse’s owner has the foresight to see the benefits of prehab, it will exponentially help them, their horse, and their veterinarian after surgery.”

She takes her own patient Jack as an example. An 11-year-old dressage horse originally suffering from a suspensory ligament injury, Jack was eventually also diagnosed with overriding dorsal spinous processes, aka kissing spines. Jack came to Hawkins’ facility overweight, unfit, inverted in his posture, and lacking engagement from his back and hind end because he had been

laid up from his suspensory injury. Jack’s two months of prehabilitation before his kissing spines surgery was a game changer, Hawkins says.

“Because of his improved fitness preop, he was able to quickly rebuild his topline

post-op,” she explains. “The gelding made a full recovery and went back to showing, and his owner happily reported that he felt stronger and better than ever before.”

Now, let’s get into why this is possible with prehabilitation.

Prehabilitation in Practice: Preparation Is Key

“The more we can do before surgery to set horses up for success postoperatively, the better,” says Schnabel. “Routinely performing core and mobility exercises with horses preoperatively will put them in the best physical place to succeed postoperatively and actually be able to better balance and protect an injured limb or area of the body during recovery.”

Hawkins uses a strategic combination of a hot (aka automatic) walker, dry and water treadmills, and purposeful hand-walking to prehab surgical candidates. She explains her methodology:

■ The hot walker promotes fitness and endurance by encouraging the horse to walk at a steady rate, going both directions, for a predetermined amount of time. “On the other hand, while turnout is vital to the horse’s mental health, free movement in a paddock is not considered a fitness element in our prehab process,” she says.



Acclimate horses to any rehab equipment you will be using, such as PEMF therapy, prior to surgery.

You know I
like your dogs.
The barking,
not so much.

📷 #nohorselikemyhorse



The Future of Prehab: Dynamic Compression Devices

Lauren Schnabel, DVM, PhD, Dipl. ACVS, ACVSMR, associate professor of equine orthopedic surgery in the Department of Clinical Sciences at North Carolina State University (NCSU) College of Veterinary Medicine, in Raleigh, and her team have recently developed the first dynamic compression device ever to be commercially available for horses. “Dynamic compression, also called pneumatic compression therapy, has been used in human medicine for decades with great success in improving lymphatic circulation and health for the treatment of lymphedema and other lymphatic drainage disorders during postoperative recovery,” she explains, noting this practice is also valuable in athletic recovery. “Our goals for horses are the same, and in many ways compression therapy is even more necessary in equines than in humans. Here’s why: Unlike people, horses have little to no musculature on their lower limbs—the horse’s muscles become tendons at the knee (front limb) and at the hock (hind limb). Muscle is needed to mechanically propel lymphatic fluid up and out of the limbs. Without such musculature, horses

rely on frog pressure from the bottom of the foot during motion to move that fluid upward. When they are injured or on stall rest, they lose this ability to move, and fluid builds up in the limbs along with inflammatory mediators and metabolic waste.” This is where the device Schnabel’s team has created comes into play.

“Our technology is able to very effectively enhance lymphatic flow in horses using patented technology with air under pressure to sequentially push lymphatic fluid out of the limbs and into the lymph nodes,” says Schnabel, who is the co-founder and chief medical officer of the company, Vetletics Inc.

In a recently published NCSU study ([TheHorse.com/1125183](https://www.thehorse.com/1125183)), treatment with this device resulted in significantly enhanced lymphatic flow compared to the control group. For this reason Schnabel views it as an essential tool for horses in the postoperative period to restore lymphatic health and clear the limbs of inflammatory mediators and metabolic waste with the goal of reducing pain and improving healing.



For horses prehabilitating or on stall rest, incorporate pole work during hand-walking to work on proprioception.

- A dry treadmill allows the user to control the speed and incline of the horse’s movement and provides controlled exercise on a firm, level surface in a straight line to help correct compensation patterns.
- A water treadmill offers low-impact, high-

resistance therapy. Low-impact work is especially beneficial for animals recovering from joint injuries. Along with treadmill speed, the temperature and depth of the water can be adjusted to affect treatment outcomes as the horse’s biomechanics change in response to different water levels. Cold water naturally reduces inflammation, and salt is commonly added to help pull fluid out of tissues, further reducing edema (fluid swelling).

- Purposeful hand-walking is an underrated element of both prehabilitation and rehabilitation, says Hawkins. “I think people who are sitting on their phone, not paying attention while hand-walking their horse are missing an opportunity,” she says. “For a horse that’s on stall rest, hand-walking is the only thing they get to do. Don’t let that time go to waste. While walking your horse, incorporate pole work to work on proprioception (awareness of where one’s limbs are in space and relation to one another). Walk over different surfaces. Something as simple as changing footing causes the horse to adjust their movement and walk purposefully. Walk up and down hills to

teach the horse to pay attention to his footfalls.”

- Prehabilitation exercises can also build core strength and mobility that can potentially protect horses from injury during recovery from general anesthesia, adds Schnabel. “They also allow the horse to maintain their topline and conditioning when continued postoperatively despite rest,” she says.

While Schnabel focuses mainly on orthopedic surgery with her research, she says the principles of prehabilitation are broadly applicable to many types of equine surgery, especially those that require a period of stall rest and immobilization following both general anesthesia and standing surgery.

“Horses needing these types of surgeries certainly all benefit from prehabilitation,” she says. “This includes acclimation to stall rest in an optimal environment for recovery, acclimation to any bandages, rehabilitation equipment, and rehabilitation exercises, and appropriate diet change as needed.”

The challenge, of course, with colic surgeries and some orthopedic surgeries such as fracture repair is these emergency situations do not allow time for prehabilitation

the way elective, scheduled procedures do, she says.

Therapeutic Modalities

No matter how well planned and thorough your horse's prehabilitation, surgery takes a toll on the body, as do confinement and immobilization in the postsurgical recovery period. Muscle atrophy, generalized weakness, loss of neuromuscular connections, edema, and stiffness can all occur from disuse and inactivity.

"We are fortunate that there are many rehabilitation modalities available now for horses to help reduce post-surgical pain and swelling," says Schnabel. "A nonexhaustive list includes cryotherapy—using either leg boots or a saltwater spa—pulsed electromagnetic field (PEMF) therapy, laser therapy, and therapeutic ultrasound. While I have had success with many of these therapies on clinical cases for certain applications, they are all different, and we are in need of more controlled studies in horses to really understand the effectiveness of such treatments, when they should be used, and possibly how they should be combined with each other or with compression therapy (see sidebar) in the postoperative period."

Final Thoughts

"What initially presents as a setback—such as a suspensory ligament injury or a



A water treadmill offers low-impact, high-resistance exercise, which can help prehab surgical candidates and is especially beneficial for animals recovering from joint injuries.

kissing spines diagnosis requiring surgery—can actually be the catalyst for change that improves your horse's overall well-being," says Hawkins. "Not all injuries can be prevented, so when you are presented with one, ask yourself which exercises, modalities, and prophylactic measures you can implement into your horse's routine to mitigate his 'baseline' weaknesses and keep him sound in the future."

That's prehabilitation, and it means looking at more than just the primary problem. "When a horse hurts himself, we tend to get hyperfocused on that injury," she says. "What I really love doing is taking a step back and looking at the horse as a whole. Finding the compensation patterns to resolve in order to avoid causing re-injury in the long run. This knowledge is power." 🐾



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