

The Art of
Arthroscopy



Hock OCD is particularly common in standardbreds, and with a diagnosis confirmed by x-rays, many yearling owners decide to have the problem treated surgically via arthroscopy before the horse goes to sale or enters training.

For the very first time, we take you behind the doors of Caledon Equine Hospital with Dr. Bruce Watt and his team to experience the procedure in its entirety.

Story by Lindsay Day // Photography by Matt Waples

For the first time in his young life, Bertie, a sprightly little yearling, finds himself off of the farm property where he was born and raised. Unbeknownst to him, he is slated for arthroscopic surgery on account of some faulty cartilage floating around in his hock joint. So far, he's adjusted well to his temporary new digs – a bright, airy stall at Caledon Equine Hospital. His pasture-mate from home, scheduled for castration, is stabled directly across the aisle-way.

On the day of his surgery, Bertie takes all the preliminary procedures in stride. He's compliant when the veterinary technician pierces his neck with a catheter to administer medications. He doesn't object when an intern rinses his mouth out with the hose. He stands still, for the most part, while his legs are x-rayed one more time. He is even, to his credit, altogether unconcerned by the fact that a photographer and I have mysteriously started following him around.

But now, just outside the surgery suite, backed into a corner within the blue padded walls of the induction room, Bertie is beginning to look a little concerned. Watching from the doorway I can see the whites of his eyes flash as he surveys his surroundings. Hearing the distressed calls of his friend left behind in the stabling area, Bertie lifts his head high, and with ears locked forward and nostrils flaring, he belts out a shrill, ear-piercing whinny that echoes through the hospital.

Unsure of what's going on as a thickly padded gate is swung out from the wall towards him, but suddenly quite certain he'd rather be some place else, Bertie vies for an

escape. But he is promptly stopped in his tracks by his handlers and gently guided back into place with the gate secured by his side. After giving the yearling a moment to settle, an intern holds his head steady while the veterinary technician dispenses the contents of two syringes into the catheter that provides a direct pipeline to his jugular vein.

Bertie soon grows very quiet, the tension visibly slipping from his body as the drugs start taking hold. Seconds later I watch his head drop behind the gate as his little body makes its way to the ground. From the other end of the hospital, the calls of his companion go unanswered.

Arthroscopy, the procedure for which Bertie is scheduled, is a type of minimally invasive surgery used to assess and treat injury and disease within joints. First introduced in equine medicine some 40 years ago, arthroscopy is credited with revolutionizing the field of equine orthopedics, making joint surgery a far safer and more practical treatment option for many conditions.

Performed under general anesthesia, arthroscopy is now a routine procedure in many equine hospitals. It's used to treat traumatic joint injuries like fractures, bone chips and soft tissue lesions. More recently it has been applied in the treatment of tendon sheath problems as well. Arthroscopy is also commonly used to address problems associated with developmental orthopedic diseases like osteochondritis dissecans (OCD) – the disease process that has landed Bertie at Caledon Equine Hospital.

➤ On the rubber floor of the induction room, Bertie lays splayed out on his side, his eyes open but not seeing. Getting to work right away, Katelyn Watson, the veterinary technician at Caledon Equine Hospital, carefully guides an endotracheal tube down Bertie's throat and into his airway. Meanwhile, the rest of the team gets him hooked up to the overhead hoist system. With the push of a button on the handheld control pad, the yearling's legs begin to lift upwards until he is suspended upside down several feet off the ground. In this manner, dangling by his ankles, with someone carrying his head, Bertie is guided to the oversized operating table that waits outside the doors of the surgery suite.

Lowered and secured into place, the year-

ling lays on his back... eerily still. Most horses – Bertie included – don't breath well on their own once anesthetized and require some assistance. Promptly hooking up the anesthesia machine, Watson connects the white hoses to Bertie's endotracheal tube. As one of the interns hugs the balloon-like device on the side of the machine to her chest, Bertie's stomach rises and falls as he takes an assisted breath.

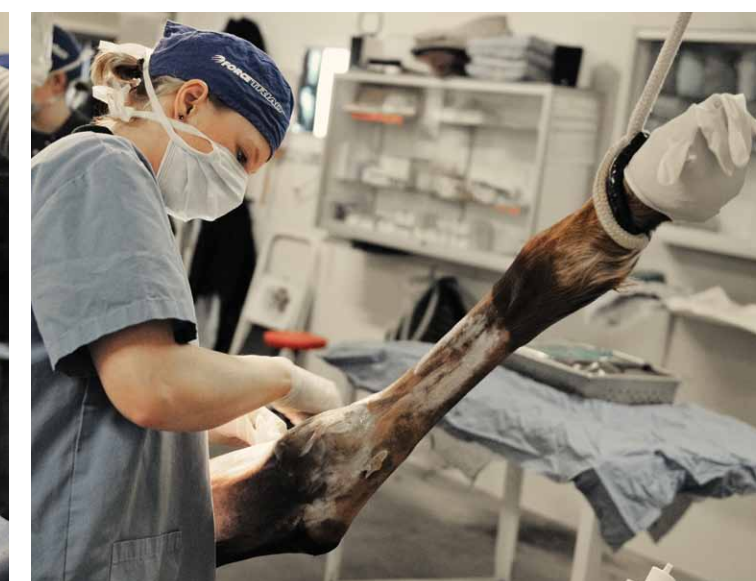
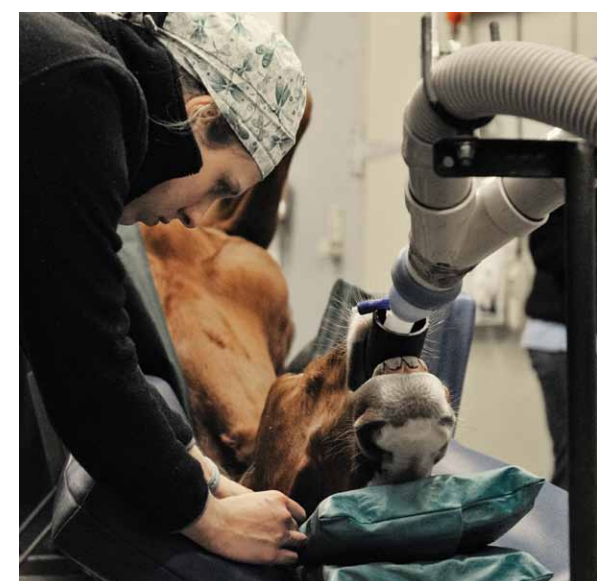
From now until the end of surgery, the yearling will be closely monitored. Heart rate, respiratory rate, blood pressure and blood-gas levels, eyeball position and blink reflexes all give important clues about his status and depth of anesthesia. The anesthetic gas and other drug dosages are adjusted accordingly to keep him in that ideal zone where he is not at risk of waking up, but is not so deep that his heart rate and blood pressure drop too low. Adequate blood pressure is particularly important to ensure the horse's muscles receive enough oxygen and nutrients to prevent them from essentially tying up – especially those of the back and hindquarters that are under their own weight while on the table.

While Watson tends to monitoring Bertie's condition, the rest of the team gets him prepped for surgery. Working smoothly and efficiently like a well-oiled pit crew, they see that Bertie's hind leg is clipped, vacuumed, scrubbed, wiped, and scrubbed vigorously several times more. His front legs are strapped up and his hooves donned in rubber gloves. Twenty-three minutes after Bertie was first brought into the induction room, the brakes of the table are un-clicked and he's rolled into the surgery suite.

➤ OCD is a developmental disorder in young growing horses that results in malformed pieces of cartilage and bone within a joint. The goal with arthroscopic surgery is to remove the unhealthy tissue. "The inside of a joint only likes to see cartilage, synovium (the interior lining of the joint capsule) and synovial fluid," explains veterinary surgeon Dr. Bruce Watt. "If the inside of the joint sees something else, like an OCD fragment of malformed cartilage or the unhealthy bone that's underneath it, then it won't be happy and it will produce more and more joint fluid in response."

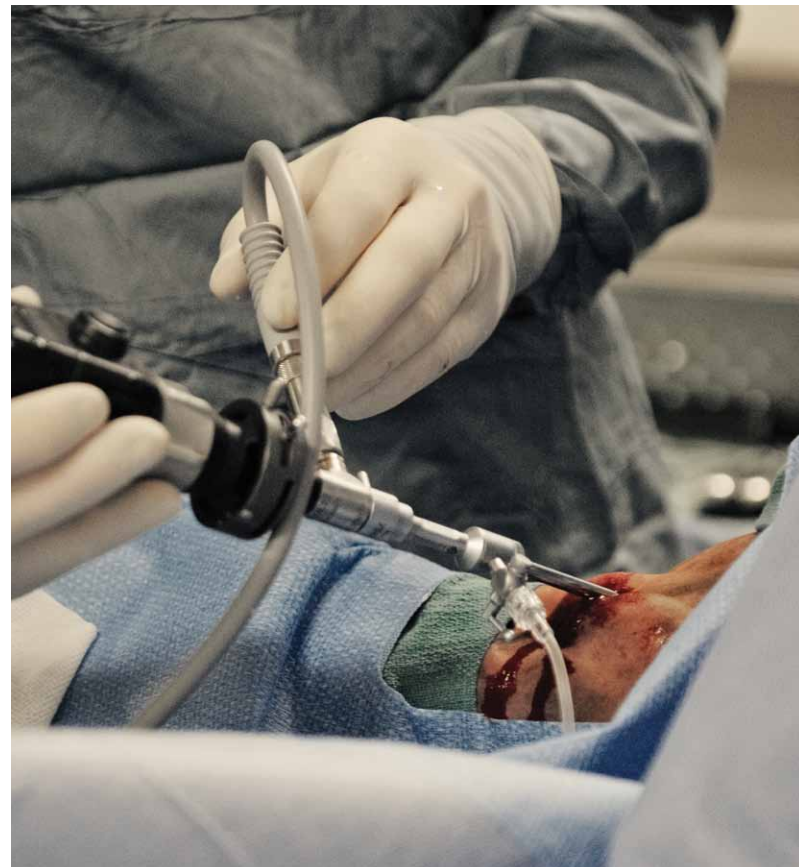
Hock OCD is particularly common in standardbreds, who as a breed are predisposed to the condition. A boggy hock is the

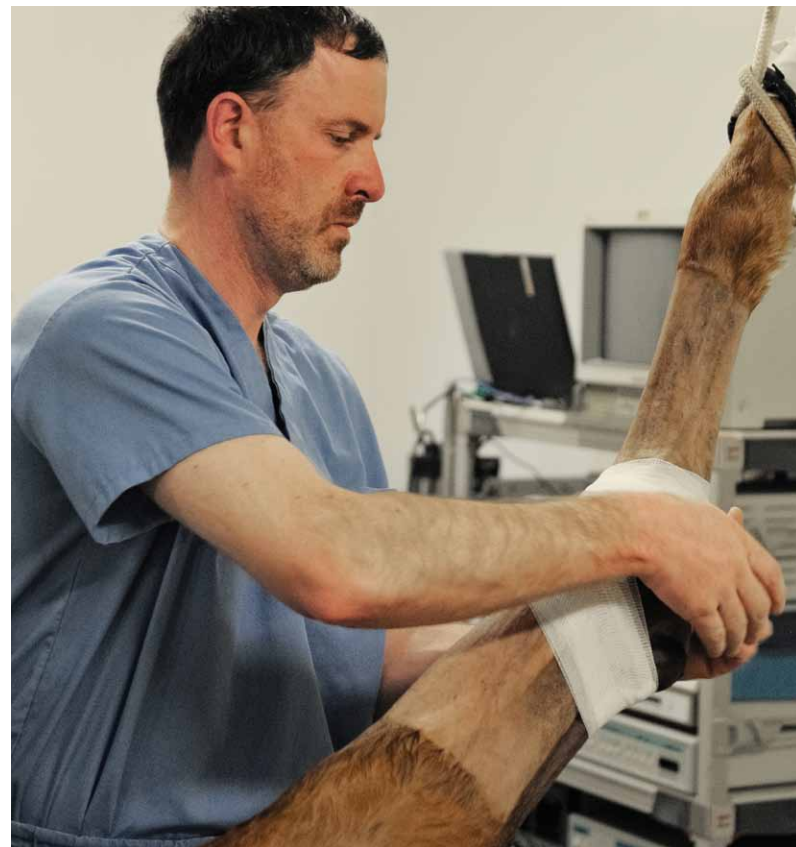
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most common clinical presentation, which may or may not be accompanied by lameness. The stifle joint is also another fairly common location for OCD lesions in standardbreds.

With a diagnosis confirmed by x-rays, many yearling owners decide to have the problem treated surgically before the horse goes to sale or enters training. Full recovery after surgery usually takes about 10 weeks. The prognosis depends on the site and nature of the lesion, though for the typical standardbred hock OCD lesion, the prognosis for future athleticism is generally very good.

► Inside the surgery suite, radiographs of Bertie's hock hang illuminated on the wall. In the center of the room, Bertie lays on the table, the lower part of his body draped in sterile blue surgical sheets, his upper half hooked up to various monitoring devices and IV bags. Before making the first incision Dr. Watt inserts a needle to fill the joint with sterile fluid. Creating a small opening in the skin with his scalpel, he then inserts the arthroscope, a slender tool about the size of pencil that is equipped with a tiny video camera. Instantly the inside of Bertie's hock joint becomes visible, many times magnified and in full colour, on the computer monitor ahead of us. Little bubbles within the sterile fluid zip by across the screen as Dr. Watt angles the instrument in different directions, expertly surveying this interior world of bone and cartilage. The pink synovial villi, the slender projections of the soft tissue lining of the joint, flap around in the current. As he pauses over various boney crevices, I think I can make out some of the pieces of cartilage that look like they don't belong.

Through another small incision a few inches over from the first, Dr. Watt is able to insert his various surgical tools, each appearing in turn in magnified form on the monitor. Using an ice-cream scoop like implement he scrapes away at the bone and cartilage, the sound of which is audible from across the table. With pincer-type devices he plucks out the fragments and cleans away the debris. Listening, feeling and using the image on the screen as his reference, Dr. Watt continues to work away as the bits of unhealthy tissue, once wreaking havoc inside Bertie's joint, line up on the green cloth on the trolley next to him.

With two stitches each to close up the two incisions, Dr. Watt completes his impressive intra-articular cleaning service. Raising the

operating table and directing the overhead lights at Bertie's abdomen, Dr. Watt now sets his sights on his next task – castration – a fairly simple, though less elegant, procedure. But for Bertie and the rest of the team, one of the biggest challenges in equine surgery still lies ahead.

► For a 1200 lb. animal that spends the better part of its life on its feet, and for whom fleeing from threatening situations is a deeply ingrained behaviour, ensuring a safe and quiet recovery from anesthesia presents its own unique difficulties. In the early stages of recovery from anesthesia, a horse seldom has sufficient neurological and muscular coordination to move anywhere quickly, but that doesn't stop them from trying, and potentially injuring themselves or others in the process. From custom designed floatation devices in pools, to inflatable air mattresses and padded walls, a number of strategies have been devised to help ensure a safe return to consciousness for the anesthetized horse.

As Dr. Watt and I talk in hushed voices on the raised walkway that surrounds his hospital's padded recovery stall, Bertie lays flaked out below us in a pair of red shipping boots, his one leg thickly bandaged. The two interns are positioned one at each of the far corners of the walkway, one with a rope connected to Bertie's halter, the other with one tied to his tail. Not even lifting his head off the ground yet, Bertie manages a very muffled sort of half whinny.

"We use head and tail ropes on the vast majority of horses that recover here," Dr. Watt explains quietly. "A lot of horses will try to get up before they are really ready, so at that point we can tighten the ropes and give them a bit of assistance. We don't lift them up, but we help stabilize them so they're not going around the stall doing flips and somersaults."

On the floor below us, Bertie starts to stir. "What these girls are looking for," Dr. Watt continues, "is how well he is able to use his muscles. That's how you can tell how awake they are. Right now his eyes are still all over the place, so the muscles that control the eyes aren't working yet. And his tongue, that's packed full of muscles too, so when he can pull that in that means he's in good shape to stand successfully."

Bertie's not there yet. After some ineffectual flailing and scrambling, he takes a break for a while with his head resting against the padded wall. Then, summoning his strength,

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he rallies again, this time successfully clambering to his feet. He staggers a few steps but with help of the ropes is able to keep his feet underneath him. Standing there, exceedingly quivery, patches of wet, matted hair on the sides of his body and his tongue still partially hanging out, Bertie's looking a little worse for wear. But Dr. Watt smiles. For him, "getting the silly critter up and standing again," is one of the most rewarding parts of his job. "That and knowing that the work that's been done is going to help keep the horse sounder."

Making his way back to his stall with Watson at his head and Dr. Watt holding his tail from behind to keep him steady, Bertie's pace starts to quicken as he hears his friend calling out to him. Eager whinnies turn to soft nickers as he approaches.

Back in his stall, Bertie is permitted a small handful of hay to help him settle and feel like a horse again. When the anesthesia has worn off completely he'll be allowed to eat properly, and by tomorrow, after a bandage change and new set of x-rays, he'll be ready to go home. For now, quietly munching on his tuft of hay, impervious to the recent loss of his testicles and blissfully unaware of the bits of cartilage that have been taped to the side of his halter, I think for Bertie, all feels pretty good in the world. **I**

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