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# Learning to Walk

**By Mason Vierra**

One day, when my grandchildren ask me to tell them about the Great Pandemic of 2020, I will tell them that I was sent not to the wards, untrained and unsure but eager to help, but home, to read, and zoom, and learn what I might while keeping myself safe.

I will tell them how disappointed I was to be left out and how afraid I was that I would never be a great clinician because of this false start. But I will also tell them what I learned watching grapes ferment and turn to wine and figs fall from trees. I will tell them how I treated a hoof infection on Jack, the donkey, and a breast infection on Misty, the Great Pyrenees. I will tell them that I constructed a genetic lineage for the sheep, gave tetanus shots to the lambs, and reluctantly neutered Pancho, Jack's son. And I will suddenly light up, remembering the birth of a baby donkey and nine puppies, and how much I learned being a parent to them. Yes, as a first-year medical student at the University of Chicago, there is much to be learned in the way of biology, medicine, and physiology at our ranch in Monterey, California. Mostly, I will tell my grandchildren what I learned watching my surgeon father stand back and let nature run its course when it seemed to me that we should step in and take control.

It started with Jill, our pregnant donkey. I was hiking when I received the text from myparents that Jill was in labor. It was a casual text – without urgency or excitement – but to me, it was a momentous piece of information that sent my legs sprinting down the mountain.

I'm a first-year medical student, after all. Didn't my parents know how useful I would be in an animal birth, given my knowledge of G-protein coupled receptors and the dermatomes of the skin and the glycolysis pathway? But when I arrived, Lefty, whose name we had chosen beforehand as a tribute to an old Willie Nelson song, lay at Jill's side, covered with blood and amniotic fluid but nonetheless healthy.

He tried to stand but stumbled, and I longed to come to his side and aid him in his efforts. But my dad said no – that we should allow him to stand and fall and stand and fall until his legs could bear his weight, and finally, after a long while and with great effort, Lefty stood and wobbled to his mother.

But Lefty's day wasn't over, for next came his most formidable task – learning how to nurse. Baby donkeys, like many mammals, are born without protective antibodies in their blood, and are susceptible to pathogen infections early in life. They therefore must receive colostrum –the first milk – through nursing or bottle-feeding -- within their first 12 hours. Thus, I began to fret as I watched Lefty search in vain for Jill's teats for 30 minutes, and then an hour, and then

longer. Jill coaxed, fumed, and nudged Lefty in the right direction, but he still seemed incapable of nursing.

My dad told me not to worry. “Donkeys have been raising their young for thousands of years. He'll be fine," he said. But we too, have been raising our young for thousands of years, and yet modern parenting relies on a slew of tests, drugs, and devices to finely tune the birthing and raising of our children. We give mothers lists of vitamins to take and foods to avoid. We recommend books and seminars and support groups. We stock our stores with breast pump devices and "smart" cribs that soothe babies to sleep. All newborns undergo extensive genetic screenings and Apgar score testing, and today nearly one-third of deliveries in the United States are by C-section. Is there not some hypocrisy in extolling the natural majesty of the maternal-child bond while simultaneously making use of modern, and yes, in many ways unnatural, human technology? Is there not some hypocrisy in being a surgeon while simultaneously insisting that Lefty would be fine on his own?

I decided to intervene. I knew that if Lefty could just start the suckling, Jill's body would respond in a self-reinforcing way. Lefty's suckling would stimulate mechanoreceptors in Jill's teat, causing a nervous signal to be sent to the pituitary gland in her brain. This gland, in turn, would release two hormones into the blood – prolactin, which contributes to milk production, and oxytocin, which stimulates milk ejection through the teat. And this ejection of milk would encourage Lefty's suckling, which would encourage the further release of prolactin and oxytocin, and the milk let-down reflex would produce a positive feedback loop resulting in Lefty feeling satiated and satisfied. At least that’s what I’d learned in my pre-med biology course, and how different can human and donkey physiology really be? To jumpstart this process, I knelt below Jill and pinched her teat until milk dribbled out, then rubbed this across Lefty's mouth and brought him to her side.

But still he could not suckle, and with a defeated look, he collapsed to the ground. Jill is a mother of tough love, however, and without warning, she launched a great hoof upon Lefty's body, jolting him awake. Fresh off a recent medical school discussion about child abuse and mandated reporting, this horrified me. But my dad assured me that mothers know best and that this was simply Jill’s way of persuading Lefty to continue his efforts.

I wasn’t convinced, but admittedly, Dad was right: After receiving a second kick, Lefty stood up, gave another attempt at suckling, and finally succeeded, closing his eyes as he tasted the nourishing colostrum.

I sighed, relieved. But still, I thought of what could have had happened, and I wondered why my father, the surgeon, the person who cuts people open every day precisely because nature has failed, was so confident in his commitment to non-intervention.

Misty, a Great Pyrenees and Akbash mix and one of our livestock-protection dogs, had a different experience, although my father and I found ourselves at a similar impasse.

The birth process began at midday on a Tuesday, just as I was preparing to give a presentation on insulin prices over zoom. We had been expecting the new arrivals, and in preparation, had brought a whelping box filled with hay into the barn and had set aside twine to tie off the umbilical cords, a sterilized pair of scissors to cut said umbilical cords, and rags to stop any bleeding. Yes, I was prepared. And excited, too: my parents were at work when Misty plopped herself into the whelping box to notify us of the imminence of her labor.

This meant I would be the midwife. But my excitement was mixed with dread. Dread that something would go wrong on my watch – the same dread I imagine interns feel the first time a patient codes and there is no attending around to help. I called my dad to see if he might be home soon. But he was in surgery, doing a Whipple procedure, and I decided that was an adequate excuse for him not to rush to Misty's aid. If it had been an appendectomy or "lap chole," however, perhaps I would have been less sympathetic.

But like Jill, Misty is independent and didn't need a human, physician or otherwise. The first puppy slid out, still in its amniotic sac. Misty immediately touched her nose and teeth to the sac, gently tearing it open, and the puppy took its first breath. She next located the umbilical cord, chewed through it in seconds, and, unlike Jill, who had buried her placenta with her great hooves – promptly consumed the placenta with gusto, even faster than a Hollywood celebrity. She then licked the puppy over and over, which cleaned the puppy and encouraged breathing. She licked the genital areas to stimulate urination and defecation and even consumed the puppies' waste – an act that we may find revolting, but that represents a survival instinct to both rid the whelping box of scents that could attract potential predators and prevent the spread of diseases.

She then nudged the puppy to her teat to initiate suckling. And as the day went on this pup was joined by a sibling, then two, and then three more. Each time a new puppy joined the family, Misty grew more efficient at natal care, and I squatted by her side the whole time, useless but enthused. Just like all men during childbirth, my friends teased. At the end of it all there were nine squirming, pink, blind-as-a-bat puppies scattered in a pile in the whelping box.

That night we rejoiced in Misty's success and patted ourselves on the backs, and all wondered how Misty – an immature dog notorious for chasing chickens and escaping pastures to frolic with coyotes – knew how to tear amniotic sacs, rip umbilical cords, consume placentas and clear puppy waste.

But while my father spoke eloquently of the majesty of maternal instinct and the sophistication of biological evolution that allows for pregnancy and birth, I thought of its delicacy and of how easily a wonderful day could have turned dark. I thought of what would have happened

had Misty been alone and unable to access her whelping box in the barn. I thought of her giving birth in the pasture surrounded by heavy, stomping donkeys and sheep and goats. And I thought of stillbirths, and hemorrhages, and the accidents of childbirth that make obstetricians so important. Surely, then, we can't marvel at the body and all its physiology without recognizing how easily it can fail. And surely my surgeon father, who spends his days intervening in the most extreme and unnatural ways to save peoples' lives, must be skeptical of nature's intelligent plan.

It wasn't long before my father and I found ourselves at odds with raising the puppies. We disagreed over letting Misty out of the barn so she could spend time away from her puppies. My dad said that this was natural, as historically, the mothers would have needed time away to hunt. But I was worried that this was negligent – that a snake, a bobcat, a puppy-sniffing monster might find and kill the puppies in Misty's absence. Sure, in nature, dogs may take breaks to hunt. But in nature, they don't eat leftovers and kibble, and in nature they don't get dewormed and vaccinated, and in nature they don't get anesthetized to remove foxtails that have burrowed into their ears. Left to nature, things die.

Convinced of this, I quickly became a helicopter parent. I bottle-fed the puppies constantly, even though Misty was nursing just fine. I installed a "puppy cam" to watch them from my phone, and during the night, I checked on them every few hours in case the puppy cam had missed the puppy-sniffing monster I was so worried about.

One day, Misty left the whelping box, and out of protective parental instinct, she attacked one of our other dogs and wound up with a gaping hole in one of her teats. In the ensuing days, I thought it best to cover the teat so that the puppies wouldn't nurse from it, giving it a break from the trauma of suckling. But my dad said that the wound needed to breathe and that allowing milk to flow through the underlying tissue would help it heal. So, we allowed it to stay open, draining it of pus every so often.

However, as the days went on, it became increasingly clear that the wound was growing infected, and we decided to start Misty on an antibiotic. Predictably, I felt uneasy about this. I recognized the necessity of fighting Misty's infection, but I also knew that the antibiotic could be passed through breast milk, and I worried that this might cause adverse effects in the puppies. This concern was amplified by the fact that one of my research interests is the gut microbiome, and I was aware of the mounting, though inconclusive, evidence that antibiotic use early in life can lead to gut dysbiosis and an increased risk of gastrointestinal diseases. But my father reassured me that the puppies' gut biomes would be restored from the fertile petri dish of the farm no matter what we did. Besides, he joked, "maybe the antibiotics will make the pups grow faster. Why do you think they're added to livestock animal feed in the U.S.?"

As Misty recovers from her wound, her puppies grow strong, and Lefty learns to gallop, I like to believe that my attentiveness and helicopter-parenting were indispensable. But I'm heading back to Chicago soon, and I also recognize that my parents get along just fine without me in

my absence. And while I am troubled by what I perceive to be a paternal indifference and an inadequate concern for all that could go wrong on a ranch, I must also recognize that my father has been caring for patients – human and animal alike – far longer than I have. Maybe he knows a thing or two about this.

I asked him what he thought explained our differences, and his response surprised me. He said that as a surgeon, "I have never in my entire career healed anyone. I break stuff, and then rearrange the parts so that the proper parts will heal together. I suture stuff together until the body can heal the wound shut. I take out stuff that isn't supposed to be there and then trust that the body will heal the wound I have created. Everything I do is intended to help the body do its job – a job it has learned through millions of years of evolution, techniques that for the most part are shared between donkeys and dogs and cats and people."

I would like to go back in time to try to understand how and when my father developed this belief. And I would like to see him, and his partners, and the accomplished physicians at The University of Chicago when they were my age. I would like to know whether they too had the impulse to be overbearing and whether they ever felt unqualified, anxious, or gut-wrenchingly nervous about taking their patients' lives into their hands. And today, I would like to know how they can go about their daily lives knowing that a missed diagnosis, or a wrongly prescribed medication, or a slip of the wrist intraoperatively, might harm a patient. When I look back at the Great Pandemic of 2020, I hope I will remember Lefty's wobbly first steps and the puppies' first barks. I hope I will remember my medical education in the pasture and the whelping box and the dirt. And when I return to Chicago in the coming days, I hope that I will take the lessons I learned from my father, Jill, and Misty.

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