

Tufts

VETERINARY MEDICINE

New Season, New Life

Saving foals is a labor of love
for Cummings' neonatal team



PLUS: MAKING HEADWAY AGAINST DISEASE ■ TUFTS V.E.T.S.



They are brand new, beautiful—and vulnerable. The magic of foaling season can also be marred by illness. Saving these innocents is the 24-hour calling of Tuft’s neonatal program.

new season, new life

IT IS A CHILLY APRIL MORNING. DR. MARY ROSE PARADIS, who directs the equine neonatal program in the Hospital for Large Animals, receives a call from a referring veterinarian: Newborn foal MilkyWay and her mom are on their way to the hospital. The foal’s birth, while slightly premature, was uncomplicated. But now, several hours later, the foal is hypothermic and still too weak to stand. She also has a very weak suckle reflex. Since she’s unable to nurse, she hasn’t received any antibody-rich colostrum, present only in the first liter or so of the mare’s milk. When this happens, a foal is vulnerable to bacteria in the stall that is usually harmless to a foal with a healthy immune system. Many of the foals arriving at the neonatal unit haven’t gotten colostrum for one reason or another. This places them at high risk for an overwhelming and life-threatening infection called septicemia.

MilkyWay is a fictional foal created to tell the story of the neonatal unit at the Cummings School’s Hospital for Large Animals. She is a composite of real patients, representing common conditions and scenarios seen within the neonatal unit.

BY LESLIE LIMON | PHOTOS BY MELODY KO



SAVING THE NEWBORN

The neonatal team is ready and waiting when the owner pulls up an hour later. MilkyWay is in the back seat of the car because it is too cold to transport her in the trailer with her mom. (Unless a foal is orphaned—or there is no plan to bring foal and mother back together again—the mare accompanies the foal to supply milk and to ensure bonding with her baby.) The team lifts the foal out of the car and onto a gurney and begins lifesaving measures as they're bringing her into the hospital.

"Sometimes we'll even intubate a foal literally as it's going onto the gurney," states Dr. Melissa Mazan, V93, VR98, who brings expertise in equine respiratory medicine to the neonatal unit. "Usually between two and four veterinarians and multiple technicians work on a critically ill foal—we need 'all hands on board' if we're going to save it," she adds. Dr. Daniela Bedenice, a boarded specialist in both emergency and critical care and large animal internal medicine, is a vital part of this team, providing critical care monitoring and pulmonary support.

One person examines MilkyWay. Someone else takes a blood sample and hands it off to a third, who runs it down to the laboratory. In the meantime, someone is inserting a catheter to begin intravenous fluids. The mare waits in a stall in the hospital as her foal is taken to the Marilyn M. Simpson Neonatal Intensive Care Unit (NICU), a single tiny room with a small foam mattress. There she receives round-the-clock treatment, supported by a pile of pillows to keep her resting on her chest to facilitate breathing. A warm air blanket keeps her warm as intravenous lines give her food—typically a mix of glucose, amino acids and fat—as well

Previous page: Lacey, owned by Sid and Pat DeBello, stands with her mother, Chantilly Lace. **Above:** Lacey follows her mother closely. **At right:** Dr. Mary Rose Paradis, Theresa Pancotto, V07, Dr. Melissa Haskell and Dr. Kara Lascola, V03, treat '06 Fleur, who came to the clinic dehydrated, in shock and with severe diarrhea at just 3 days old.

as plasma, fluids and antibiotics. The plasma makes up in part for the antibodies she lacks; the antibiotics fight infections resulting from her compromised immune system. Although many foals can receive intensive care in a stall with their mothers, those being fed intravenously must stay in the NICU, explains Paradis, because "food is very easy to contaminate. You need to administer it in a clean area to keep dust from entering the dedicated catheter. You also have to mix it carefully under a sterile hood."

REVOLUTIONIZING NEONATAL CARE

As Paradis describes these protocols during a recent tour of the facility, her calm, matter-of-fact manner belies their significance. The fact is that by instituting measures like these, she "revolutionized the care of foals," states Dr. Joseph Merriam Jr., of the Mass., Equine Clinic in Uxbridge, Massachusetts, a referring veterinarian. "Dr. Paradis was on the forefront of inserting a feeding line to give neonates a steady drip of nutrition in cases when they can't eat or won't suckle," he says. He adds that Paradis, Mazan and Bedenice were instrumental in instituting the practice of watching critical-care foals literally 24 hours a day.

This is precisely the level of attention MilkyWay receives even after she is moved into the stall with her mom. Thankfully, their separation from each other has only been a few days. "If they're so sick that we



have to take them away from the moms," explains Paradis, "then after about two or three days the moms don't recognize them any more and will reject them." The foal still can't suckle but is ready to be fed her mother's milk, so intravenous feeding is replaced with an indwelling nasogastric tube, a tube inserted through the nose, down the esophagus and into her stomach. This allows someone to feed her with a funnel or a bag of milk as often as once every hour.

"Most mares will let us milk them," says neonatal veterinary technician Maggie Underwood, "though if you have people doing it who are a little new at it, the horses may be resistant at first." Among those who are "new at it" are the cadre of volunteers who sign up each February for training, then join the neonatal foal volunteer team to take a four- to six-hour shift to sit with a sick foal. Veterinary students coordinate and schedule the volunteers.

THE GOODNESS OF THEIR HEARTS

One of those coordinators was Dr. Peggy Brosnahan, V02, now an internal medicine resident at the veterinary school at Oklahoma State University. Brosnahan, a neonatal technician in the Hospital for Large Animals before coming to the veterinary school, became a neonatal foal team coordinator as a



student. “Volunteers are veterinary students, faculty and staff from other areas of the school, members of the community—even undergraduate students from Tufts and Worcester Polytechnic Institute,” she says. “It’s a pretty outstanding learning experience for anybody who’s been involved.”

The foal volunteer team is “invaluable,” says Mazan. “These are people who dedicate their time out of the sheer goodness of their hearts. They sit with the foals, make sure they don’t get tangled in their lines, obtain the foal’s vital signs, milk the mares—and generally make round-the-clock care possible.” Volunteers call the hospital before their

scheduled shift to confirm whether or not they’re needed. But even if the answer is no, they need to be on call. A typical overnight might need only one or two volunteer “sitters,” but during a particularly heavy week last April, more needed to come in to sit with the nine sick foals in the hospital.

Round-the-clock care has worked wonders for MilkyWay; by day three it is no longer necessary. By day four she is standing and alert and has gained weight. But her suckle reflex still isn’t quite strong enough for her to nurse, despite regular stimulation by neonatal technicians. As each day goes by, there is some concern that the mare’s milk supply may start to dwindle, even with frequent milking, and special feed or drugs may be necessary to support lactation. Though MilkyWay is still too weak to nurse, the mare nuzzles and smells her, maintaining that fragile bond. Finally—on day five—the veterinary technicians’ persistence pays off: MilkyWay begins to seek out her mom’s

udder and make attempts to nurse. Soon it will be time to take out the feeding tube, and another day or so after that, she and her mom will be ready to go home.

TEACHING MOMENTS

The length of time it takes a foal to recover has much to do with how quickly an owner and the referring veterinarian realize that critical care is necessary. Paradis drives this point home to her students when she tells them, “You cannot wait on sick babies—you can never say to a client that you’ll be there in two hours.” Delaying a call to the neonatal unit carries financial consequences as well: “I tell my students that if clients call within six hours of birth, a problem will cost a fraction of what it will cost if they wait 24 hours.” This is not the first time during our tour that Paradis’ teacher side emerges. As we pass a stall holding a brown foal and a gray mare, she explains that the foal’s “raccoon eyes” are because he’s shedding his brown baby coat, revealing the gray coat beneath. When she cracks open the door to get a better look at him, he bucks and rears up, then after satisfying his curiosity about the visitors, starts to nurse strenuously from his mom, who bellows in annoyance. Paradis admonishes the youngster: “C’mon, kid, be careful. Don’t be so rough!” But she remarks that the foal’s behavior is a good sign. “I always tell my students that a ‘bad baby,’ one you can’t catch, is a healthy baby. A ‘good baby’ is a very sick baby.”

Moments like these are indicative of the constant intersection between clinical work and education in the neonatal unit. In fact, Paradis based the content of her recently pub-

TUFTS’ NEONATAL CARE AT A GLANCE

FOALING SEASON: In New England, normally from March or April until about mid-July. The most active months in the neonatal unit are April and May.

PATIENT DEMOGRAPHICS: From all over Massachusetts, as well as Connecticut and Rhode Island. Many will go on to be sport horses, trained for jumping, cross country and dressage events. A few are bred as racehorses. Most of the rest are companion animals enjoyed for trail riding.

PATIENT CARE STATISTICS: Most arrive within the first 24 hours of life. About 75 percent of them will need a neonatal technician to sit with them around the clock for at least the first one or two nights. The average stay is approximately one week.

NEONATAL FOAL TEAM VOLUNTEERING: E-mail Maggie Underwood at margaret.underwood@tufts.edu

At right: '06 Fleur on the road to recovery while Lacey moves outdoors to kick up her heels.

lished textbook, *Equine Neonatal Medicine: A Case-Based Approach* (see related article), on the most common conditions and diseases seen in the unit. And this past foaling season proved that she had made the right choices. “I was on duty during six weeks of really intense work,” she says. “In that period, we had an example of every single case in the book.” With a laugh, she adds, “I was copying chapters for the students left and right—I think I must have copied the whole book for them!”

Brosnahan, who is also a Ph.D. candidate with plans to teach veterinary medicine, attests to Paradis’ dedication as an educator and mentor, calling her “an outstanding teacher—one of the best I’ve ever worked with. Things I learned from her I’m still using on my own foal patients on a day-to-day basis. And from the perspective of someone who plans to stay in academia, she’s an outstanding role model.”

The unit’s small size contributes to the quality of the education students receive there. “We may get only about 50 babies a year, as opposed to an equine hospital down in Kentucky where they might get 450 babies a year,” states Paradis, “but it’s the right number for teaching the variety of things that can affect the animals.” She also suggests that due to the unit’s manageable size, “our babies may get more attention than in a larger hospital, so we actually do pretty well.”

SUCCESS AS A STATE OF MIND

“Pretty well” translates into an 85 percent success rate among patients, virtually none of which would survive without treatment. Paradis maintains that this is consistent with



EQUINE NEONATAL MEDICINE: A CASE-BASED APPROACH

“Learning a litany of facts about a certain disease without having a particular patient or story to tie those facts to is inefficient and unproductive. Telling stories or presenting examples allows the reader to use imagination to conjure up the patient and question what might be happening. The reader becomes an active participant in the case.”

This statement, from the preface to *Equine Neonatal Medicine: A Case-Based Approach*, summarizes the goal of this textbook by Dr. Mary Rose Paradis, associate professor of

clinical sciences at the Cummings School.

The first time she taught, more than 25 years ago, Paradis used the same lecture approach that most of her own professors had used—and found it boring. She realized that if she was bored, then so were her students. She remembered that one of her favorite courses in veterinary school at the University of Georgia was taught using a case-based approach, so she switched—and never looked back. “Even with a class of 76 students,” she says, “I present a case, and

ask, ‘What do you think is happening here?’”

Paradis designed this book using the same model, presenting 30 cases in 14 chapters covering the spectrum of neonatal diseases and disorders—complete with complications—that veterinarians are most likely to encounter. “There are probably twice as many other things that can happen to foals, but those are the essential ones,” she states. “Anyone who reads this book and digests it will have a solid handle on neonatal equine medicine.” To collect the cases, Paradis con-



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other first-rate neonatal units around the country, attributing the overall success in the field to a collegial exchange of knowledge among clinicians and researchers. Merriam, however, believes Tufts' success rate may be somewhat higher than most, and that having the odds strongly in their favor at Tufts makes an enormous impact on his clients' decisions to treat sick foals. One of those clients, equestrian and author Elizabeth Benney, was first referred to Tufts 13 years ago when her mare delivered twins. Paradis worked tirelessly for a month on the surviving foal, named Sooner, ultimately saving her in spite of multiple complications. She became a healthy filly who went on to have a foal of her own. Benney's story of Sooner's miraculous recovery was published in *Horseman's Yankee Pedlar*.

Certainly much of the unit's success is attributable to such highly skilled clinicians as Paradis, Bedenice and Mazan, who draw on their expertise as well the sophisticated tools that allow them to characterize, diagnose and treat disease: endoscopy (including gastroscopy), ultrasonography and nuclear imaging all boost the hospital's capabilities. But successful treatment of a critically ill foal goes beyond fixing the immediate problems, says Mazan, and therein lies another key to the strength of the neonatal unit. “With anything we do, we have to take into account that this baby needs to grow into a sound and healthy animal of 1,000 or 1,200 pounds,” she says. “A horse with poor joints or feet, for example, will break down. So we have to care

about the whole animal.”

The truly differentiating strength of the neonatal unit, however, might just be its state of mind. “What makes any neonatal clinic good,” says Paradis, “is the enthusiasm of the people running it and a true love of the foal. You really have to love it to do it well. A clinic that really prefers other types of cases might not be as aggressive as we are.”

At the very heart of that aggressiveness—coupling skill with dedication and optimism—is Paradis. “Even in cases that other people might consider hopeless, more often than not she'll say, ‘we'll fix this one,’” states Underwood. “And more often than not, she's right. And even with the ones we don't save, we always learn something for the next time. She's the best.” **TVM**

tacted colleagues—including several at Tufts—before the 2004 foaling season began. She asked them to choose a case from that season as it unfolded and to take pictures. “I wanted the book to have photos because I wanted readers to be able to see each animal and connect with it,” she comments. The authors wrote their cases according to a strict formula: to tell the story of the foal, one installment at a time, and after each one, to discuss anatomy and physiology in the context of diagnosis and treatment. The resulting approach, in her words, “encourages people to read for a bigger picture.”

Once she completed the final selection of cases, Paradis did a remarkable thing: With the support of the Dorothy Russell Havemeyer Foundation, she invited all the authors to come together at Tufts' European Center in Talloires, France, and present their cases to each other. About half of them attended. As one of the foundation's primary investigators, Paradis is expected to hold a conference or workshop every three years and was permitted to use one of her workshops for this purpose. “It's not usual that an author of one chapter gets to talk to the author of another chapter,” she says.

“People actually got to respond to each other's cases, ask questions and bring up ideas that the author could respond to.” The resulting discussions built rapport among the authors and contributed to the book's unified voice.

Since the book was released in May 2006, Paradis has turned her attention to her next project: to create a different book, drawing from the same collection of cases, that would be more accessible to a lay person such as a horse owner or a breeder.

—LESLIE LIMON