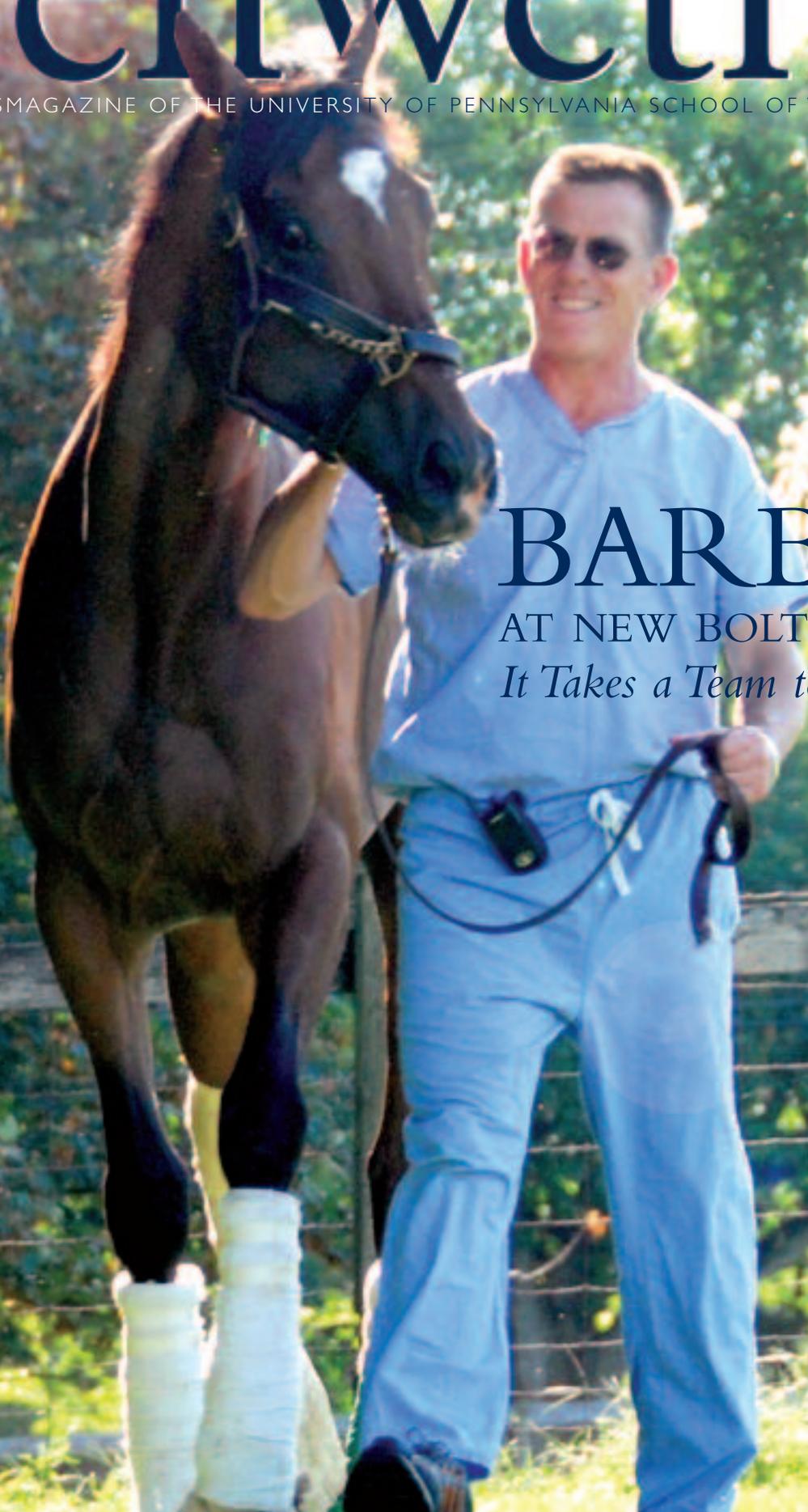


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BARBARO

AT NEW BOLTON CENTER:
It Takes a Team to Mend a Horse



Penn
Veterinary Medicine
Many Species. One Medicine.™

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about the cover:

The incredible healing connection between animals and people is the very foundation of veterinary medicine. Sometimes our compassion is for all living beings; sometimes just one becomes the focus of our commitment to save a life. Dr. Dean Richardson and Kentucky Derby winner Barbaro exemplify that connection here, pictured away from the Hospital's Intensive Care Unit, walking in the sunlight, united in a fight for survival. Photo by Sabina Louise Pierce.



Everybody on a championship team doesn't get publicity, but everyone can say he's a champion.

Earvin "Magic" Johnson

Barbaro

It Takes a Team to Mend a Horse:
How New Bolton Center Staff Joined Forces to Help Barbaro

BY SUSAN I. FINKELSTEIN
AND GAIL LUCIANI

They had always been a team; each department, each person had an integral part in the workings of New Bolton Center, the University of Pennsylvania's 700 acres in rural Pennsylvania where some of the finest veterinary services available can be found. Doctors and nurses, admissions and housekeeping staff, telephone operators and mail clerks—all were part of an elegant, complex synergy of healing animals and helping people. Yes, they had always been a team, but they may not have realized it until Saturday, May 20—when a champion horse faltered before the eyes of millions of people. The horse was Kentucky Derby winner Barbaro, and his larger-than-life presence at the George D. Widener Hospital for Large Animals since then has connected all New Bolton's players in not only caring for this horse loved round the world, but in keeping the Hospital at the top of its game.

Saturday Afternoon and Night

Soon after his shocking injury barely out of the gate at the Preakness Stakes, Barbaro was stabilized by track veterinarians (which included **Dr. Scott Palmer, V'76**, and Dr. Dan Dreyfuss, former surgical resident at New Bolton), and then rushed from the Pimlico Race Course in Baltimore to Widener's Intensive Care Unit. Well-wishers had begun to gather at the Hospital, displaying signs—"Barbaro, we love you" and "Good luck, wonder horse"—hoping to catch a glimpse of their fallen hero. Reporters and broadcast vans came in droves in anticipation of the horse's arrival.

Chief of Surgery **Dr. Dean Richardson** saw the misstep that ended Barbaro's career at the Preakness on television, just after finishing a difficult surgery in Florida. Not only was he immediately in touch with Barbaro's trainer and veterinarians, radiographs of the right hind leg were e-mailed to him within minutes. "I knew we weren't going into surgery right away; we've learned that it's best to give supportive care for 18–24 hours instead of immediately performing surgery," said Dr. Richardson. "But after seeing those radiographs, I didn't get a whole lot of

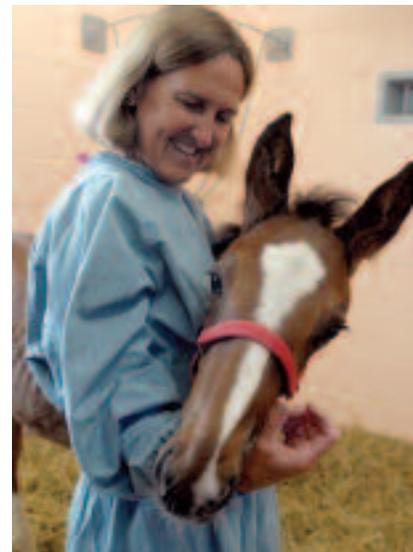
sleep. I knew exactly what the fracture looked like and what was ahead of me."

By 9:00 p.m., Barbaro's ambulance, accompanied by a caravan of cars, including a police escort, pulled into New Bolton Center. **Dr. Barbara Dallap, V'94**, assistant professor of emergency medicine and critical care, was waiting to examine the colt. "The vets at the track did a wonderful job of stabilizing him," she said. "He was able to walk into his stall in Intensive Care, where he remained for the night."

Sunday Morning

News vans, microphones, cameras, satellite dishes, mobile broadcast towers—not exactly the type of equipment you would expect to see at a hospital for large animals, but just as familiar a sight outside Widener during those early days as horse vans, trailers and cattle trucks. Journalists from around the world had been at the Preakness on May 20, but immediately after the accident, many began the 82-mile journey to New Bolton Center to report on Barbaro's condition and the doctors' plans.

Saturday night into Sunday—and for days afterward—scores of reporters camped in their cars or vans on the Hospital grounds, waiting for news, emailing stories back to big-city or hometown newspapers, or broadcasting updates to television and radio stations. The previous evening at Pimlico, the scene had been "chaotic and borderline unruly," according to Tim Layden, who writes the "Inside Horse Racing" column for SI.com. But **Dr. Corinne Sweeney**, Widener Hospital executive director and associate dean for New Bolton Center,



Dr. Corinne Sweeney visits a young horse.

barbaro timeline

May 6:
Wins Kentucky Derby by 6-1/2 lengths for sixth straight win.

May 20:
Breaks down at start of Preakness Stakes; shatters three bones in right hind leg.

May 21:
Undergoes five-plus hours of surgery at the George D. Widener Hospital at New Bolton Center; stainless steel plate and 27 screws inserted; surgeon Dean Richardson calls chance of survival a "coin toss."



May 22:
With a fiberglass cast from hock to hoof, settles into stall in intensive care unit.





ALLO
ALLO
ALLO



Farrier Robert Sigafoos and Dr. Emma Adam with Barbaro.

handled everything with a “quiet calm,” admired Layden, which was “transferred to very overtired journalists.” (The donuts and pizza, compliments of the Hospital, also may have helped fend off the fatigue.)

Dr. Richardson arrived at the Hospital by noon, having taken the earliest flight from Palm Beach, Fla. Initially, no plans were made to talk to the media before the surgery. But because the room had already filled to almost capacity, Drs. Richardson and Dallap spoke to the group for about 10 minutes to let them know their strategy for the day. “When will you begin the surgery?” asked one reporter. “As soon as you stop asking me questions,” retorted Dr. Richardson. He left to see his famous patient, and the long wait began.

Waiting for News

The complex surgery to repair the three fractures in Barbaro’s right hind leg took five hours and required 27

pins and a stainless steel plate. “Barbaro presented with a case that was about as difficult as such an operation could be,” said Dr. Richardson. He had performed many similar surgeries, but this case was more complicated; Barbaro had suffered fractures to his cannon bone, sesamoids and long pastern, and he also suffered a dislocation of the fetlock joint. The long pastern was broken into more than 20 pieces. Assisting in the complex procedure were **Dr. Bernd Driessen**, associate professor of anesthesia, and residents **Drs. Liberty Getman, Steve Zedler and David Levine**.

The operating room at the George D. Widener Hospital is equipped with a monorail that runs to the recovery pool. The pool-recovery system allows a disoriented animal to waken suspended in a specially engineered harness and rubber raft, allowing him to gallop or flail in the warm water until fully conscious, significantly reducing the risk of re-injuring the damaged limb. Once awake, he is hoisted from the raft and moved to the recovery stall where he can stand at once. When Barbaro’s surgery was completed, he had the first of several successful recoveries in this specially designed pool—a photo of the event taken that evening appeared on the front page of every major U.S. newspaper the next day, and was featured as a two-page spread in *Sports Illustrated* the following week.

The colt “practically jogged back to his stall” in the ICU with the new cast on his hind leg, according to Dr. Richardson. Once the patient was safely in his stall, Dr. Richardson, joined by trainer Michael Matz, met with a standing-room-only crowd of journalists in the Woerner Amphitheatre to discuss the surgery and answer questions. (For progressive updates on Barbaro’s condition, please see www.vet.upenn.edu.)

Slow and Steady Healing

In the following days, Barbaro’s right hind leg slowly healed. He had special visitors—his owners **Gretchen, CW’59, and Roy, C’61, Jackson** came almost daily, as would his trainer, Michael Matz. Jockey Edgar Prado came, followed by Penn president Amy Gutmann and Pennsylvania governor Ed Rendell. Press conferences practically became the norm—but life at New Bolton carried on.

“At the Widener Hospital on the day of one of our press conferences, beyond the buzz of activity and media



May 27:

Fitted with a special three-part, glue-on horseshoe for left hind hoof to reduce risk of laminitis.

May 30:

Jockey Edgar Prado visits; Richardson says recovery still months away.



June 10:

Stood in stall as Jazil won Belmont Stakes.

trucks in the parking lot, I saw barn workers cleaning, nurses and students caring for patients, and a surprised-looking sheep in a wheelbarrow being returned to its stall,” said Dr. Joan Hendricks, the Gilbert S. Kahn Dean of Veterinary Medicine. “If one scene spoke most about the professionalism of NBC’s staff, faculty, students and administration, it was this one: in the face of sudden and unprecedented media attention and all the attendant disruptions and stress, patient care was the main focus. This is exactly how it should be, and I hope everyone realizes how much their work is appreciated.”



Dr. Nadine Salomon, V06, with an alpaca, part of New Bolton’s huge caseload during Barbaro’s stay.

Other Patients

Barbaro was not alone in the ICU. “We have a lot of other patients here too, and they get the same level of care that Barbaro gets—without the media attention. Everybody here is working hard,” said Dr. Richardson. For the nursing staff, the pressure was just as intense, as they cared for patients that included a lame alpaca, a foal stepped on by its mother, and mares with difficult deliveries. “Our ICU nurses and nursing assistants have been challenged by the attention that comes along with having a ‘celebrity’ patient,” said **Rosemarie Richardson**, New Bolton’s director of nursing. “But they have also enjoyed seeing a

focus on the important work we do here every day. A lot of people can better understand our role now?”

A Generous Donor and a Message Board of His Own

At this time, an anonymous donor gave a very generous gift to launch the Barbaro Fund, donations of which go directly to support the work of New Bolton Center, not for Barbaro’s care. “It’s wonderful that we can create something so very good out of Barbaro’s tragedy and help celebrate animal athletes,” said Gretchen Jackson, Barbaro’s owner and a member of the School’s Board of Overseers. “This fund in Barbaro’s name will honor him and provide a lasting resource to help care for other animals treated at New Bolton Center.” (Donors can find out how to offer monetary gifts at www.vet.upenn.edu/giving/giving_ways.html.)

Barbaro also has a message board set up in his name for the thousands—more than 50,000 as of early August—of well-wishes sent to him electronically. The School’s Web site (www.vet.upenn.edu) had a fourfold increase in hits—some days, especially those with press conferences, reaching as high as 177,000, compared to daily pre-Barbaro numbers of 500 to 1,000. Visitors can check updates on Barbaro’s condition and photos posted for the media, as well as explore other sections of the site to learn more about the School providing Barbaro’s treatment.

Laminitis Strikes

While hopes were high that the three-year-old colt would heal from the massive injury to his right hind leg, one of the biggest threats to his survival was laminitis; at an emotional news conference on July 13, Dr. Richardson announced that Barbaro had indeed succumbed to the little-understood inflammation in his left hind foot. Laminitis is a painful condition in horses that can have any of a number of causes, including excessive weight bearing in one limb. It occurs when laminae, the strong connecting tissues that attach the pedal bone and the inner hoof wall, are inflamed.

“While his condition is stable, it remains extremely serious,” said Dr. Richardson, as he explained the implications

June 13:
Placed under general anesthesia to have cast changed for first time; Richardson says “his leg looks excellent!”

June 18:
A month after injury, colt’s recovery is going smoothly—“He’s a lively, bright, happy horse. If you asked me a month ago, I would have gladly accepted where we are today,” Richardson said.



July 3:
Cast replaced; two bent screws are replaced and three new ones are added across the pastern joint.



July 5:
Cast replaced because of discomfort; receives treatment for small abscess on sole of uninjured left hind hoof.





The New Bolton Center nursing team, with Barbaro. From right to left: Jaime Miller, CVT; Lindsey March, patient attendant; Kasey McCafferty, CVT; Beth Waters, patient attendant; Ray Gonzales; Kim Stouffer, patient attendant; Jen Reynolds, patient attendant; and Lisa Moore, patient attendant.

of the condition at the press conference. Barbaro was being monitored very closely because signs can change quickly. Dr. Richardson later added, "It's important to remember that Barbaro's treatment could easily continue for many weeks, and if all goes well, several months. Our goal is to keep him as comfortable as possible, and clearly that comfort level will be a major indicator for our treatment decisions."

Doctors commented on Barbaro's intelligence; his quick understanding of what was required of him in the healing process, from relaxing in his sling so as to reduce weight on his feet, to cooperating in the recovery pool after cast changes. "He has a very positive attitude," said Dr. Richardson. "If you look at this horse, it would be very hard to put him down."

And so the work and the waiting continue.

The Gift Horse

In the months that have passed, thousands of fans from around the world have sent cards and posters, baskets of carrots and apples and sweets, bouquets of roses, letters and e-mail messages to Barbaro and to those who have been caring for him. And Barbaro is not greedy; of the thousands of treats sent to him, he enjoys what he can, and shares the rest with other equine patients.

Among the people signing for the profusion of gifts has been **Kathy Freeborn**, in Patient Admissions. Each day,

florists' trucks bring literally dozens of packages to the Hospital's front-desk area, where Kathy works. "Barbaro has touched the hearts of people all over the world. It's good to know there is so much love in the world, and that people take the time to show they care," Kathy said.



Kathy Freeborn at the admissions desk with two of the daily deliveries.

Neither Rain nor Snow...

And then there are well-wishers who choose to *mail* their presents, letters and cards; whether via the U.S. Post Office or express mail services, the New Bolton mailroom has seen more activity than ever before. Mail clerk

Nick Raimato has been kept busy receiving, sorting and delivering the influx to the proper places—namely to Barbaro and his caretakers. Since Barbaro's arrival in May, the steady wave of packages and paper has hardly subsided at all. "I've been amazed at the public's continuing interest in Barbaro and his well-being," Nick admitted. "Many of the cards and parcels from the Post Office have been sent as certified return receipt, insured and registered—I'm waiting to see if we will get one 'restricted delivery,' requiring Barbaro's signature for release."



Nick Raimato in NBC Mail Room.



July 8:

Undergoes surgery to treat new infection in leg; cast replaced, this time with a longer one that provides additional support; doctors replace plate and many of the screws.

July 10:

Cast replaced again, this time with a shorter one; Richardson believes there will be "some tough days ahead."



July 13:

Barbaro has severe case of laminitis in left hind foot; Richardson said Barbaro has "a long shot" to survive; surgeons performed a hoof wall resection, removing large portion of hoof wall because it wasn't connected to coffin bone; Barbaro being treated aggressively with pain medication.

Hospital director Dr. Sweeney also has been touched by many of the letters and cards that have come into the Center, some addressed to Barbaro, some to New Bolton staff. “The letters sent to Barbaro—some, of course, are ‘Get Well,’ ‘Go Barbaro,’ ‘We love you’—but some people have shared their own personal tragedies and successes,” she recalled. “‘Dear Barbaro, I too have had major injuries or multiple fractures, but you can persevere, you can endure.’ These are the messages that America wants to share with us; very few of them have been anything but inspiring.”

Perhaps the most poignant messages to Barbaro are from children, and Dr. Sweeney has a pile of kids’ homemade cards, words and horses colored in crayon, many bedecked with glitter. “With some of the children’s cards, you can see that the teacher has prompted them to think of a topic relating to Barbaro. I smile because you can see the teacher was using this as a writing exercise and suggests they write a salutation, and they all do,” Dr. Sweeney laughed. “One little boy wrote, ‘Dear Barbaro, Well, I guess you’re not reading this since you’re a horse.’ And then, ‘Dear Barbaro, I’m not even sure if you speak English.’ That was a pretty good one.”

“The World Was Calling”

In the hours and days after Barbaro’s accident, countless well-wishers and media types from all over the globe were part of the unprecedented number of information-seekers, especially remarkable for those working and living in the usually bucolic Kennett Square. The main method of early contact was by telephone, and the sound of ringing in the Hospital offices was constant. “The phones ring an awful lot anyway; they were ringing almost nonstop before Barbaro,” Dr. Sweeney recalled. “But then if you can imagine that night, and those next days, the world was calling. We had one number, and they called. They weren’t here, they weren’t sending emails, they weren’t sending get-well cards—they were calling. The switchboard was inundated.”

“It’s human nature to want things to go well. For Barbaro, it’s upsetting to everybody that he didn’t have the chance to live up to his potential. He’s very personable and he has a lot of charisma,” Dr. Richardson explained. “Goodwill from people around the world has been tremendous; I haven’t been able to answer my office phone in three months. This is real, genuine



Widener Hospital telephone operators. Standing, from left: Diane Combs, Noreen Stengel and Ashlee Elville. Sitting, from left: Linda Heiberger and Kay Carr.

goodwill. A lot of people are caught up in the story of this horse, and that adds a lot of pressure.”

Diane Combs was one of the operators fielding calls at New Bolton. “After the last press conference, two voice-mail boxes were set up just for calls concerning Barbaro, since the switchboard and the surgery secretaries were unable to keep up with the volume of calls. Many concerned callers simply want to know how he’s doing or send their well-wishes or prayers, while others have advice to offer and some have products they feel might be beneficial to Barbaro’s recovery. Some callers are quite emotional. It is truly amazing the love and concern shown for Barbaro.”

The added stress and inconvenience of almost constant media attention since May 20 has only strengthened the spirit of teamwork at New Bolton Center. Doctors and nurses, admissions and housekeeping staff, telephone operators and mail clerks—all will continue to do their jobs, as a team, healing animals and helping people. ♡



Photos by Sabina Louise Pierce and Jennifer Rench



July 15:

Dr. Richardson reports that Barbaro had a “very good night” and remains in stable condition; the horse’s heart rate and pulse are normal, and appetite is good.

July 17:

Barbaro’s right hind leg cast changed to take new radiographs and examine incision; radiographs looked good, plates placed on July 8 to fuse pastern were intact and fetlock fusion was unchanged; modified foot cast on Barbaro’s left hind hoof also changed; both cast changes performed with Barbaro lightly sedated in sling.

July 25:

Left hind foot bandage changed; “I’m happy with the appearance of this foot, which is doing as well as can be expected,” said Dr. Richardson.



meetthe**press**

Since May 20, New Bolton faculty and staff have had close encounters with media of all types looking for angles on their own particular Barbaro story. Below are tidbits from their experiences, as well as some interesting “Barbaro by the numbers” stats.



Defining moment: Quote from Mike Gathagan, vice president of communications for the Maryland Jockey Club, 8:00 p.m., Saturday, May 20, to **Gail Luciani**, Penn Vet director of communication: “We had 1,600 credentialed members of the press at Pimlico today. And they’re headed your way.”

How reporters were kept occupied during Barbaro’s five-hour surgery: Two tours of the Scott Building; two treadmill demonstrations with **Dr. Eric Birks**, assistant professor of exercise physiology; stacks of *Bellwethers* and 20 pizzas.



One picture is worth a thousand words: Freelancer Sabina Pierce was called in as the pool photographer, i.e., one who shoots for all media outlets and then shares the photos. Using an in-house pool photographer also meant we could control distribution and maintain ownership of the photos. The photo of Barbaro being lifted from the recovery pool was

printed on the front page of every major newspaper in the country on Monday, May 22. It was also featured as a two-page spread in *Sports Illustrated* the following week. Other high-resolution photos were put on Penn Vet’s Web site for the media’s use.

Good Morning, Sunshine: Dr. Richardson did interviews with the Today Show, Good Morning America, the CBS Early Show as well as CNN American Morning.

Local media congregated in front of the Widener Hospital, and Dr. Richardson answered questions in time for their noon live updates from New Bolton. Reporters from evening news shows arrived later.



Number of requests for interviews: More than 500

Number of interviews given: More than 275

Number of press conferences: 5

Coverage: In the first two weeks, local and national television news covered Barbaro and New Bolton Center extensively. Penn Vet appeared on numerous broadcast outlets including ABC, NBC, CBS, CNN, ESPN and, locally, WPVI-TV, WCAU-TV, Fox 29 and KYW-TV. Film was syndicated to television stations around the country. Radio coverage includes NPR, WHYY and many small and syndicated stations from across the U.S.

New Bolton was mentioned as the “best possible” place for Barbaro in an Associated Press article that appeared in newspapers across the country and around the world.

Dr. Dean Richardson was profiled on the front page of the Sunday edition of the *Philadelphia Inquirer*, and jockey Edgar Prado’s visit that week was also covered. *Time* and *Newsweek* ran photos and in addition to Dr. Richardson, **Dr. Corinne Sweeney**, **Dr. David Nunamaker, V’68**, **Dr. Liberty Getman**, **Dr. David Levine** and farrier **Rob Sigafos** were quoted in various broadcast media

outlets and in news articles by the Associated Press, Reuters, the *New York Times*, the *Wall Street Journal*, the *Los Angeles Times*, *Forbes*, the *Baltimore Sun*, the *International Herald Tribune*, *USA Today* and numerous other newspapers.

Number of photos posted on the Penn Vet Web site: 52

Number of updates posted on the Penn Vet Web site: 43, including additional information on farriers, equine reproduction, the recovery pool and FAQs.

Most original gift to Barbaro: \$500 for upkeep of the recovery pool from the University of Notre Dame swim team.

Web site: 25,000 to 30,000 visitors came to our Web site daily through the week of May 22. Pre-Barbaro, the Penn Vet web site had 500 to 1,000 visitors a day.

Message board: “We haven’t put a keyboard in Barbaro’s stall yet,” joked **Dr. Dean Richardson**. But Barbaro has his own message board—in time, more than 50,000 entries would be posted from fans and well wishers; these were in addition to the hundreds of e-mails sent to just about every e-mail address posted on Penn Vet’s Web site.

Best partner: Thanks to the support of the National Thoroughbred Racing Association, press conferences were

open to media across the country via teleconference, and press conference transcripts were available on-line.

Most unexpected media requests: From Geraldo Rivera and *Inside Edition*.

Penn Vet’s Emergency Communication Team: Elana Beck Arons, Karen Coghlan, John Donges, Susan Finkelstein, Coreen Haggerty, Pat Hall, Peter Ivanick, Kate Judge, Greg Lester, Gail Luciani, Ken McCardle, Dori Myers, Jennifer Rench, Jane Simone, Andrea Withers and Jennifer Worden.

Memorable quote: Jockey Edgar Prado, visiting Barbaro for the first time since the accident, says, “If tears could heal Barbaro, he would be healed by now.”

Biggest challenge: Getting reporters to say “the University of Pennsylvania” instead of “a vet clinic in Chester County”—bonus points for those who also said the “School of Veterinary Medicine.”

Most appreciated advice: From Greg Lester, University Communications, Wednesday, May 24, to Gail Luciani, when, after four days, the demand for media interviews hadn’t let up: “Tell them no more for today.”

The future: *Nightline* is working on a half-hour feature about Barbaro and New Bolton that should air in the fall.

Award: Dr. Dean Richardson and New Bolton will receive the Joe Palmer Award, presented annually for meritorious service to racing, from the National Turf Writers Association on Nov. 1. ♣

Photos by Sabina Louise Pierce and Jennifer Rench



Above, on the day of a national press conference, owners Gretchen and Roy Jackson greet jockey Edgar Prado, who was visiting Barbaro for the first time since the accident.

Right, Dean Joan Hendricks (center; in grey jacket) sits amidst members of press from around the country.



Our alumni submitted questions to the medical team caring for Barbaro, some of which follow with their answers. But doctors weren't the only ones communicating with New Bolton staff: children sent in hand-drawn get-well cards from all over the country, and we've included a sampling of those here as well.

What part of the body did Barbaro's bone graft come from?

The bone graft came from the tuber coxae (a bony prominence of the pelvis often called the point of the hip) and consisted of cancellous (spongy) bone.

—Dr. David Levine, surgery resident

I understand it's a major challenge for a horse to be stall-bound for four months or more. Do you have a defined program of stimulation/intervention to prevent depression?

No, but it is important to try to keep the horse comfortable and happy, and the horse's personality and attitude also play a large role in this.

—Dr. Evita Busschers, surgery resident

Describe the feeding program that is now in place for Barbaro. How has it changed from his feeding regiment before the accident? What has happened to body weight and body condition score?

Before he was hospitalized, Barbaro was being fed three times a day. His morning ration was two pounds of a high-protein sweet feed with corn oil. His afternoon ration was two pounds of oats and four pounds of sweet feed with corn oil. His late evening ration was, again, two pounds of oats and four pounds of sweet feed with corn oil and a scoop of fat supplement. He is currently getting two pounds of his owners' sweet feed with corn oil three times a day with a scoop of fat supplement in his morning grain. We have increased him to four feedings a day. While he has maintained his weight during his hospitalization, he has lost some body condition, mostly muscle. This of course is not unexpected as Barbaro went from 'working out daily' on the racetrack to spending his days standing in a stall.

—Kasey McCafferty, CVT, ICU/NICU charge nurse

As a former student at NBC, I would love to know the role students are playing in Barbaro's care and recovery.

Barbaro was like any other patient a student has on a surgery rotation, but just with a little more press. As the student assigned to his care, every morning I would give him a thorough physical exam followed by any treatments he was due for at that time. He is surprisingly very easy to work with and has a very spirited personality. Surely, he may be one of the most famous patients I may ever have the opportunity to work with.

—Taryn Gassert, fourth-year vet student

What anesthetic /analgesic protocol was used for the surgery? What analgesics were used immediately post-operative and over the subsequent days? What is the anticipated schedule for physical rehabilitation for Barbaro, and what activities would be included (i.e., underwater treadmill, therapeutic ultrasound, etc.)?

The premedication used was as follows:

acepromazine, butorphanol and medetomidine. The anesthetic administered was

guaifensin, diazepam, ketamine, sevo + O₂, plus medetomidine – CRI. The regional analgesia was epidural morphine, also for three days post-op. Insofar as physical rehab, it is not appropriate if the horse has casted legs.

—Dr. Bernd Driessen, associate professor of anesthesia

Why did the fracture occur?

I still believe from what I saw that it was a catastrophic misstep at high speed and with the limb intensely loaded.

—Dr. Dean Richardson, chief of surgery

What medications is the horse being given on a routine basis? What is the prognosis in terms of the multiple fractures healing without affecting tendons?

Antibiotics are being administered to Barbaro at this time, as well as NSAIDs (phenylbutazone), anti-ulcer medications (omeprazole) and other analgesics as needed, including epidural drugs.

There is minimal concern about involvement of his tendons. In a horse, the only functions of the tendons are support and locomotion. Effects on 'fine' movements of the digit are major concerns in humans with distal limb injuries, but not really an issue in a horse with this type of an injury.

—Dr. Dean Richardson, chief of surgery



I would be interested to know how/why the horse was brought to Penn. Did the owners or attending veterinarian have a previous relationship with Penn Vet?

Barbaro already had many connections to New Bolton Center prior to the Preakness. Barbaro's attending veterinarian at the Fair Hill Training Center, Dr. Kathy Anderson, frequently referred her patients to Dr. Richardson at New Bolton. Barbaro's owners, Roy and Gretchen Jackson, live four miles from New Bolton and have been longtime clients of the Hospital. Additionally, Gretchen Jackson, CW'59, is on the Board of Overseers of the School. These and other factors probably entered into the Jacksons' decision as to where Barbaro would be transported following his traumatic injury at the Preakness.

—**Dr. Corinne Sweeney, associate dean, Widener Hospital executive director**

How is the vascular integrity of the distal limb assessed prior to or at the time of surgery? Is angiography the standard of care yet in equines?

The vascular integrity of the distal limb is readily assessed at surgery because the blood supply is easily characterized. Angiography probably should not be done in a horse with a warm foot and good pulses; it would be overly invasive and highly unlikely to be of value. If questions about the vascularity arose, contrast arteriography can readily be done. We routinely use venograms ('reverse-flow' contrast studies done distal to a tourniquets) to evaluate blood flow to the lamina of the foot. This is not relevant to Barbaro's acute injury to the fetlock and pastern, however.

—**Dr. Dean Richardson, chief of surgery**

What's the greatest number of pieces in a comminuted fracture Dean Richardson has ever repaired? (In other words, is this one of the most fragmented he has ever dealt with?)

Not even close. We have repaired many fractures that are the equivalent of crushed ice but most frequently we can use external skeletal fixation to manage such injuries. In Barbaro's case, that was not an option because of the long condylar fracture of his cannon bone. We also have treated several foals and a few adults with pretty severely comminuted long bone fractures using the strongest double-plating techniques combined with bone grafts. Barbaro's fracture was unusually complex because of the extreme instability of the fetlock, the severity of the comminution of P1 and the presence of the condylar fracture (plus his size).

—**Dr. Dean Richardson, chief of surgery**

What do you feel is the greatest aid to rehabilitation?

I think one of the greatest aids for rehabilitation is the horse's personality and his attitude. Horses that know how to take care of themselves definitely have a great advantage in their rehabilitation process.

—**Dr. Evita Busschers, surgery resident**

What part did the availability and use of the pool recovery system have in his care, survival and results?

New Bolton's unique pool and raft recovery system have played a vital role in Barbaro's case. Because of their natural flight instinct, horses often attempt to stand very early during recovery from general anesthesia, before they regain full muscle strength and coordination. These uncoordinated efforts can lead to disruption of the repair or additional damage to the injured leg. The pool provides a controlled recovery from anesthesia. Patients can move their legs while regaining consciousness without the danger of injury. Recovering horses remain in the pool until all the effects of the anesthetics have worn off and then are lifted from the pool and lowered directly into the standing position. Barbaro was recovered in the pool after the initial surgery and all subsequent procedures that involved general anesthesia, and stood successfully each time with no adverse effects to his injured leg.

—**Dr. Kim Olson, staff vet, critical care and anesthesia**

