BY SACHA ADORNO

Clinical Care, Research, and Education During Crisis

Clinical Care

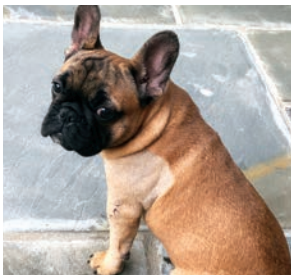
PIVOTING TO HELP AND HEAL

Pandemics don't stop puppies. Playful as ever, they still get injured, sometimes enough for an emergency room visit. That's where Jared Von Arx and Brad Windhauser found themselves in one late night in early June, after their four-month-old French Bulldog Scarlett took a tumble.

"She yelped, we scooped her up, and drove right to Penn Vet," said Von Arx. "We know Ryan Hospital well from our other dogs."

But the couple's experience was different this time. A nurse met them in the driveway to take Scarlett into the hospital for a clinical assessment. The dog's owners waited in the parking lot.

"After that, all communication was via phone," said Windhauser.



Scarlett captivated her caregivers when the puppy arrived at Ryan Hospital during the height of the COVID-19 stay-at-home period.

Over five days in March, the hospital pivoted from full-service to limited urgent and emergency cases only.

"Despite the pandemic, our committed and dedicated caregivers have never lost focus on our oath to heal and protect animals."

DR. MICHAEL MISON, RYAN HOSPITAL'S CHIEF MEDICAL OFFICER

FIVE DAYS TO CHANGE

The socially distant protocol was one of many designed to mitigate COVID-19 risks for Penn Vet clients and caregivers. Over five days in March, the hospital pivoted from full-service to limited urgent and emergency cases only.

Dr. Michael Mison, Ryan Hospital's Chief Medical Officer, explained, "We depopulated our personnel and patient population, created and adapted public health guidelines to keep everyone safe and maintain a 24/7 operations, defined 'essential' on-site services, implemented curbside triage, and adopted a work-from-home framework and telehealth consultations."

Scarlett, who'd fractured her left humeral condyle, didn't notice the changes, but her owners did. "We appreciated the concern for everyone's health." said Von Arx. "The process and communication were excellent, even at a distance."

SHIFT IN BUSINESS, COMMITMENT TO CARE

The Frenchie's case was one of a limited number in June after the hospital temporarily shifted its business model to allow for fewer cases.

"The pandemic forced us to prioritize refining and improving our operational processes to ensure efficiency in the face of limited work force," Mison said. "We've implemented changes as needed, then used data-driven feedback to adjust policies and procedures. Long term, these changes will help with overall productivity once we are back to being fully staffed."

As for Scarlett, within 18 hours of being injured, the puppy had surgery to pin the fracture. She went home after a brief hospital stay.

Said Mison, "Despite the pandemic, our committed and dedicated caregivers have never lost focus on our oath to heal and protect animals."

JOLENE'S JOURNEY

While Scarlett was on the road to recovery, Jolene, a 600-pound pig, was just beginning her journey.

Jolene — named for the Dolly Parton song — started to show signs of unsteadiness in June. By early July, her owners and regular veterinarian had tried numerous medications to no avail.

"We couldn't figure out what was going on and needed a diagnostic tool that would accommodate an animal her size," said Wendy Smith, owner of Jolene and the Odd Man Inn Animal Refuge. "I called all over the country until a veterinarian in Michigan told me about New Bolton Center's robotic CT system."

A potential hitch: The Odd Man Inn is in Washington State. Getting to Pennsylvania, an arduous trip in normal times, would be even harder during a pandemic. "We didn't give it a second thought," said Smith. "Within a day of talking to New Bolton Center, we had the trailer packed and Jolene's livestock papers ready. My husband, Josh, headed out with our girl on the 4th of July."

BUSINESS NOT AS USUAL

Stopping only to rest, man and pig arrived at New Bolton Center two days later. They found, like its Philadelphia counterpart, the hospital was not operations as usual.

In March, New Bolton Center shifted to a "limited clinical status," offering appointments and procedures only for conditions that would negatively impact the welfare of an animal if left untreated. Additionally, it implemented socially distant drop-offs and pick-ups and set up outdoor areas for waiting clients. It also launched a free telemedicine service to support referring veterinarians.

"Our goal to always provide an exceptional level of care is now layered with a dual priority of keeping our clients, community, and patient care teams safe from the coronavirus," said Dr. Barbara Dallap Schaer, New Bolton Center's Hospital Director. "We provided veterinary care for emergency and urgent cases throughout the most restrictive phases of the pandemic and have now returned to normal operations. And our telehealth service has helped bridge distances created by social isolation. The service has enabled clients and veterinarians to feel connected even when we're physically separate."

HEALING A PIG'S PAIN

When they arrived at the hospital, Josh sat in his truck while a caregiver team unloaded Jolene. He went to find a home base for his Pennsylvania stay, and a team of New Bolton Center clinicians and nurses attended to Jolene. Using the hospital's robotic CT technology, they diagnosed discospondylitis, a vertebral infection causing bone remodeling and swelling that pressed on the pig's spinal cord. Surgery wasn't required, but rest and medication were. She spent a few weeks at New Bolton Center before traveling back.

Recalled Smith, "Jolene was so well cared for by a large and loving team of nurses and doctors — it was worth the long trip!"

Many of Jolene's large and loving team joined the 600-lb pig for a group photo before the animal's discharge.

"The COVID-19 environment has really challenged us to rethink patient care and create new ways to interact with our clients."

DR. BARBARA DALLAP SCHAER, NEW BOLTON CENTER'S HOSPITAL DIRECTOR

Leaving a postapocalyptic-like scene, labs have been empty of people for much of 2020.

Research

PAUSING RESEARCH FOR THE GOOD OF ALL

What is it like to curtail research across more than 40 research centers and laboratories? "Devastating," said Dr. Phillip Scott, Vice Dean for Research & Academic Resources. "There's no other way to put it."

In mid-March, Penn Vet, in collaboration with public health officials and the University, made the difficult decision to shut down research School-wide.

"We had exceptions, but they were rare," Scott said. "For example, anyone engaged in COVID-19 research or maintaining critical research reagents was provided access to their labs, although only one person at a time."

The immediate and swift action was taken for students, staff, and faculty. The School's concern was protecting people from a contagious virus, while supporting them as they acclimated to working at home, in many cases with children and families.

Functionally, this meant closing all non-diagnostic laboratories and centers to staff. Work has continued via video teleconferencing as much as possible, and many researchers are using the time at home to write. But, said Scott, nothing can replace being in the lab with your colleagues: "It is those informal interactions that are often the most important, and they just are not happening. And, of course, new research essentially was frozen."

FROM CRISIS TO COEXISTING

Compounding the devastation was the length of the closure. "We knew COVID-19 would require a drastic response like this," said Scott. "But we had no idea how long it would last."

As days turned to weeks and weeks to months, Penn Vet, like other Penn schools, carefully monitored the pandemic's evolution and state and local responses. In May, the School slowly began planning to safely resume research.

A Penn Vet Research Restart Team of research faculty and administration developed a Research Restart Plan. The three-phased approach meets requirements outlined by the University's Research Resumption plan: Phase I allowed for increase in priority research with limited personnel; Phase II saw expansion in research operations and personnel populations; and Phase III is to be a return to full research operations, with new awareness and hygiene practices and telework whenever possible. Social distance and new sanitization policies are part of all three phases. As of publication, the School was in Phase II, and it is unknown when it will get to Phase III.

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DR. PHILLIP SCOTT,
VICE DEAN FOR RESEARCH & ACADEMIC RESOURCES

PEOPLE FIRST

Preparing for full-scale resumption of research has its challenges. At the beginning of the pandemic, the School was in crisis response mode. Today, with COVID-19 persisting and the pandemic having paused research for most of the last nine months, "we have so much to consider: the lost time for critical studies, the careers of our younger researchers, the fact that so many of our community are now called to be teachers for young children at home," said Scott.

Supporting the people behind research remains paramount, especially graduate students, postdocs, and faculty in the early stages of their careers. With Penn, the School is developing new supportive resources to help with childcare, stress, and career advancement — for example, the University has extended the tenure clock for junior faculty.

"We're picking up again, but it's not going to be easy," said Scott. "People want to be productive; they want to get back to their labs. We want them back, and we want to help them as they deal with realities of new family demands. There's a lot of rebuilding to happen. We'll get there."

Carry on with COVID-19 Research

While some studies closed down, others ramped up, particularly COVID-19 activities with the potential to make an immediate impact on the pandemic.

Among the many studies related to SARS-CoV-2 — the virus that causes the disease COVID-19 — Dr. Andrew Vaughan, Assistant Professor, Biomedical Sciences, and Dr. Montserrat Anguera, Associate Professor in the same department, are partnering with Dr. Susan R. Weiss, Professor of Microbiology at Perelman School of Medicine, to explore a curious feature of COVID-19 disease: the fact that more men than women become severely ill and die.

And Dr. Ronald Harty, Professor of Pathobiology and Microbiology, who has expertise in analyzing antivirals for diseases like Ebola and Marburg virus, is collaborating with other scientists to determine whether compounds developed to target other diseases may lessen the severity of COVID-19 infections.

Anguera, Harty, and Vaughan, are among seven Penn Vet researchers to receive COVID-19 Pilot Awards from the Penn Vet COVID Research Innovation Fund.* The Fund, provided with critical start-up support through a generous gift from Vernon and Shirley Hill, will bolster Penn Vet's rapidly expanding research and response program to fight the novel coronavirus.

"Penn Vet is a key part of the biomedical community at Penn. We are leveraging our unique and collective expertise in pathogen-related research, infectious disease, and translational medicine to fight this pandemic," said Dr. Phillip Scott, Vice Dean for Research & Academic Resources. "The COVID-19 Research Innovation Fund is affording us the agility to make immediate and significant strides toward solving this public health emergency."

*See more about Vaughan, Anguera, and Harty's work at Penn Today: *penntoday.upenn.edu/news/coming-together-solve-many-scientific-mysteries-covid-19*. More about The COVID Innovation Fund: *www.vet.upenn.edu/research/news-events-conferences/research-press-release/seven-penn-vet-researchers-receive-covid-19-pilot-awards*.

Education

TEACHING AND LEARNING TRANSFORMED

At the beginning of March, Penn Vet was education as usual with students and faculty out and about in classrooms and shared spaces. Four weeks later, the School's Kennett Square and Philadelphia campuses were veritable ghost towns, open only to urgent client cases and closed to any on-site academic activities as everyone hunkered down to teach and learn at home.

The School's COVID-19 response for teaching and learning began on March 9, when the Inaugural Strategic Response Team gathered to discuss a path forward for clinical and pre-clinical education. In the immediate days following, teaching faculty and instructors prepared for online learning that would last for the remainder of the spring semester.

"While the changes were swift and fluid, we didn't actually change our teaching model overnight," said Dr. Kathryn E. Michel, Associate Dean of Education. "We did what the rest of the University did when we had to make the switch in less than a week: we employed emergency remote teaching. In other words, we lectured online using Zoom."

By the end of March, all Penn Vet classes were virtual, and clinical year students had transitioned from in-hospital rotations to Penn Vet's Cyber Clinic. This innovative, online clinic experience fulfilled intramural rotations and externships for students about to graduate: "We decided to take a practical and appropriate approach, focusing on the things students need to know and be able to do in primary care practice," Michel told *Penn Today* in April.

"It took some time to get used to everything shifting so drastically," said Dr. Patrick Pilon, 'V20. "The School really supported us in making the transition to a virtual clinic practice. Penn Vet students know we're heading into an unpredictable world, and this experience has been a great real-world grounding in how to adapt in crisis and consider the role technology can play in veterinary medicine."

A MATTER OF DAYS, WEEKS, AND MONTHS

All told, the School adapted in a matter of weeks to present previously hands-on labs material virtually and design its Cyber Clinic. "But it wasn't until the end of the spring semester that we really took a big step back with an eye to enhancing the delivery of our curriculum for the fall," said Michel.

Throughout June and July, Michel and Mary Bryant, Assistant Dean of Students and Admissions, along with course organizers, faculty, staff, and Penn Vet's Department of Information Technology redesigned the fall curriculum. The result is a program reimagined for online classes, laboratories, and small groups.

"Our hybrid approach is optimized for online delivery and offers a combination of asynchronous and synchronous content delivery, as opposed to simply giving traditional 50-minute lectures via Zoom," said Michel.

BACK TO SCHOOL IN A NEW NORMAL

When students returned to school in September, it was to a School transformed: public and classroom spaces have new capacity limits, and many have been repurposed as quiet study or workspaces for students. Other areas have been designated as research and break spaces for anyone working on campus. And with the exception of a few practical exams, all tests are taken online.

Courses requiring hands-on activity — such as anatomy labs and clinical and surgical skill trainings — are conducted in small cohorts, while clinical rotations are back to in-person on a modified basis.

"The upside of this experience is that it has allowed us to pilot some things we had envisioned for our new curriculum," said Michel. "This includes adding a new Patient Care and Clinical Skills rotation at both teaching hospitals, expanding use of prosections for teaching anatomy, using virtual microscopy to teach histology, revising the parasitology and microbiology labs, and deliberately using a 'flipped classroom' design, which encourages active learning. Over the past few years, we have also been preparing to launch an integrated two-year core pre-clinical curriculum in fall 2021, and, against all odds, we are still on track to accomplish this plan."

Michel added that none of this would be possible without an all-hands-on-deck effort. "This entire experience, from March to now, has taken patience, ingenuity, and flexibility," she said. "The only reason we've been able to do it is because everybody has pulled together. We're going to come out of this and realize just how resilient and creative we can be."

Classroom and shared spaces have been re-designed to prevent close contact when people are working or studying on campus.