

Taking swine medicine education into the virtual world

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Telehealth video chat connects a swine barn with Iowa State's Dr. Gabi Doughan to allow Doughan to assess the animals and conduct training on blood collection in pigs. Credit: Dr. Gil Patterson of VetNOW.

Faculty at Iowa State University's College of Veterinary Medicine are laying the groundwork to teach students swine-medicine skills using virtual telehealth technology, a method that could reinforce biosecurity while allowing students to see more cases than they would using traditional approaches to teaching veterinary skills.

The use of [telehealth](#), a suite of electronic and telecommunication technologies, to supplement the teaching of veterinary students is still in its infancy, but the coronavirus pandemic accelerated the use and acceptance of telehealth technologies since early 2020.

A grant from the U.S. Department of Agriculture's National Institute of Food and Agriculture has allowed veterinarians at Iowa State's Swine Medicine Education Center (SMEC) to partner with livestock precision farming company Distynct and the VetNOW veterinary telehealth platform to test the waters. The partnership led to a successful proof-of-concept test in October during which a participant successfully learned how to draw blood from a pig while receiving instruction from a remote veterinarian via telehealth technology.

ISU veterinarians are developing further technological capabilities and foresee a bright future for telehealth in [veterinary medicine](#).

"Telehealth is the direction we're headed. It's the future," said Kristin Skoland, program specialist at SMEC. "Especially with the pandemic, people are used to being at home and using conferencing technology to be able to gain access to resources."

'Shot in the arm' from the pandemic

SMEC received a USDA-NIFA veterinary services grant program award of \$240,000 to begin exploring veterinary applications for telehealth technology before the coronavirus pandemic, but the pandemic sent

those efforts into overdrive. The pandemic limited the accessibility veterinarians had to farms, and, at the same time, people all over the world embraced video conferencing technology almost overnight. Both factors made it clear that telehealth had a role to play in veterinary medicine, said Locke Karriker, Morill Professor of Veterinary Diagnostic and Production Animal Medicine and SMEC director.

"Before the pandemic, telehealth was really in a fledgling state in the swine medicine world," Karriker said. "The pandemic gave the project a shot in the arm."

Meredith Petersen, a postdoctoral research associate for SMEC, took on the task of developing telehealth capabilities as part of her doctoral project. She immediately saw the technology's potential to provide a range of benefits for livestock producers, veterinarians and veterinary students.

For instance, Petersen said veterinary students can gain access to more facilities virtually than they can in the real world, allowing them to see more animals and review more cases than they would with strictly in-person and on-site instruction. Fourth-year veterinary students participate in two-week clinical rotations on farms to gain hands-on experience. Petersen foresees a future in which telehealth technology expands on the rotation experience, allowing students to see what's happening on farms outside of the two weeks designated for their rotations.

Telehealth technology also allows for more students to tour facilities that may limit access due to strict biosecurity measures. For instance, in the swine industry, boar studs are kept under strict biosecurity due to their value. Telehealth might allow for more students to see how such facilities are run without being physically present.



BJ Brugman and Brian Carr of Distynct and Meredith Petersen of the ISU Swine Medicine Education Center use a unidirectional antenna to boost cellular signal, allowing for fast, secure wireless capabilities inside of a swine barn. ISU veterinarians say wireless connectivity is critical to the success of future telehealth efforts in veterinary medicine. Credit: Dr. Gil Patterson, VetNOW.

Proof of concept

Catherine Neal is an employee for VetNOW, a company that designed a platform of veterinary telehealth technologies. Neal had no formal veterinary training, but earlier this year she found herself on a swine

farm managed by the Audubon Manning Veterinary Clinic. Neal showed up with a box of veterinary supplies, a camera and a speaker and took on the role of a veterinary [student](#) to test how well telemedicine [technology](#) can teach clinical skills.

Distynct provided boosted cellular connectivity to the facility so Neal could use the VetNOW platform to communicate with Gabi Doughan, a veterinarian at the Swine Medicine Education Center. Neal watched a SMEC instructional video on drawing blood from pigs, then Doughan walked Neal through her first blood draw on a real pig.

"Dr. Doughan was at the university and was able to see everything that I showed her as I walked around the barn," Neal said.

Neal successfully completed the blood draw on her first attempt and conducted two more successful draws after that.

"I felt comfortable with what I was being instructed to do, and I felt supported throughout the entire experience," Neal said, adding she would be receptive to learning additional skills using telemedicine instruction.

The future of veterinary telehealth

Karriker noted that high-speed internet is critical to the success of telehealth, but many swine facilities are in rural regions where internet access can be spotty. That may pose a challenge as SMEC continues to expand telehealth opportunities.

But investing in telehealth now could pay enormous dividends in the event of a veterinary crisis, such as a foreign animal disease outbreak among U.S. herds. Such an outbreak will require enormous diagnostic capabilities, and many in animal agriculture worry the demands could

push current veterinary infrastructure to its limit. Telehealth options could allow veterinarians to monitor livestock in more locations with greater efficiency, Karriker said.

"What happens next is dependent on the collaboration of a lot of folks," Karriker said. "We have some proof of concept, and we think there's some real imperative to keep building on this."

Provided by Iowa State University

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