Integration of Telemedicine/Virtual Care into Equine Veterinary Practice—The Why and How

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Telemedicine is an essential component along the continuum of patient care with many benefits to the patient, the veterinarian, clients, and staff. Strategic thought along with best-practice guidelines for including virtual care/telehealth in daily practice will elevate access to healthcare, improve patient outcomes, and evolve fundamental care for patients. Virtual care can be an integral part of the standard of care in veterinary medicine. Authors’ addresses: Animal Policy Group, 13802 N Scottsdale Road, Suite 151-25, Scottsdale, AZ 85254 (Green); IlluminX Consulting, Inc., 906 3rd Street, Encinitas, CA 92024 (Markell); e-mails: dreleanorgreen@gmail.com, illuminxconsult@gmail.com. *Co-corresponding and presenting authors. © 2021 AAEP.

1. Introduction

A look at the telemedicine trends in human healthcare can provide valuable insights for veterinary medicine, which often follows trends that are relevant and applicable within veterinary healthcare. Additionally, human patients are the animal owners that have come to expect a level of veterinary healthcare that rivals human healthcare. Their adoption rate of telemedicine in their own care will surely lead to similar expectations for their own animals to receive veterinary telemedicine. Telemedicine/telehealth/virtual care (referred to in this paper as telemedicine) is the natural evolution of healthcare in the digital world and has been ignited to the point that it has become fundamental in how human healthcare professionals deliver care to patients, from urban centers to rural communities. Telemedicine is the practice of medicine using technology to deliver care remotely such that treating and monitoring patients no longer has to begin and end in a hospital or clinic. Telemedicine is well positioned to become a standard service in both human and veterinary healthcare. The American Telemedicine Association was established 38 years ago, in 1983, with a goal to promote access to care via telecommunications technology.¹ Since then, the upward trajectory of adoption of telemedicine has been slow but steady until 2020, when COVID became a substantial catalyst that spurred exponential growth in the use of telemedicine by both healthcare providers and patients. By April 2020, nearly all primary care physicians (97%) were using telemedicine to treat patients.² Telemedicine use by rural health centers increased during the pandemic, peaking at 54% in the last week of April 2020.³ Medicare beneficiaries using telemedicine exploded from just 13,000 per week before the pandemic to 1.7 million per
week. Stanford Healthcare, one of the notable leaders in telemedicine, reports that 30% to 40% of visits remain remote despite the resumption of in-person visits. They cite reliability, efficiency, and convenience in allowing patients to receive routine care they need virtually anytime, anywhere. More than 75% of physicians surveyed said telemedicine provided better care for patients. Studies have shown that in most cases, telehealth was equivalent to in-person care, and in some areas, it was better. Most, if not all, veterinary clients are also human patients; thus, the opinion of these end users matters in guiding both human and veterinary healthcare. At least 28 studies have shown that > 80% of patients indicated satisfaction with telemedicine, including general practice, gynecology, psychiatry, neurology, prenatal, oncology, diabetes, and rheumatology. Levels of patient satisfaction for telemedicine are among the highest of all healthcare, insurance, and financial service industries. Patient responses indicated that 85.5% said telemedicine made it easier to get the care they needed, and 77% said they were completely satisfied with virtual care. Of patients surveyed, 75% said they prefer virtual care to be a standard part of their care, with 50% saying they would switch providers to have virtual care visits on a regular basis. Their three top drivers were convenience, speed of access, and safety of being seen at home. In contrast to what was predicted, 45,000 patients said video visits resulted in greater satisfaction than in-person visits. Some of the major factors that enhance telemedicine are the rising development and adoption of technologies, such as the Internet of Things and artificial intelligence, by human patients and animal owners. These data have substantial consequences to veterinarians because they suggest that veterinary clients are expecting telemedicine as an option in their own care, with the implication being that they will demand the same in the care of their animals. Ignoring these trends, along with client opinions and preferences, could be disadvantageous to veterinary practices and their potential for the highest level of success.

2. Definitions
Virtual care is an umbrella term that encompasses all forms of telehealth. Telehealth is a next-level overarching term that includes use of technology to remotely deliver care, information, and education. Telemedicine refers to the provision of patient care by remote application of technologies, including the transmission of information via electronic communications, such as video, text, instant messaging, telephone, etc. Synchronous telemedicine is essentially real-time virtual visits, using video, telephone, or live chat. Asynchronous telemedicine refers to the “store and forward” technique in which clients collect and provide medical history and other supporting information and send it to the veterinarian for later evaluation, and/or veterinarians collect medical history and other supporting information, such as images and pathology reports, and send them to a veterinary specialist for diagnostic and treatment expertise. Teletriage provides timely guidance, not a diagnosis, with the opportunity to obtain the patient’s medical history, learn about the current problems, and determine whether a virtual visit is sufficient to address the problem or whether an in-person visit is indicated, including how urgent that visit should be. Telemonitoring allows postsurgical and postdischarge monitoring of patients remotely. The capabilities of telemonitoring will be expanded substantially in concert with further developments of technologies, like mobile monitoring devices, wearables, insideables, etc. Digital technologies will be able to allow monitoring of vital signs, electrocardiograms (ECGs), glucose, and other relevant parameters. With teleconsulting, it is possible to assemble specialists from every specialty along with other consultants virtually in “one room,” as needed by the patient. Telecardiology has been in use for decades by means of the transmission of ECGs over telephone lines and interpretation by cardiologists or internists. Likewise, teleradiology continues to allow practices everywhere to have access to board-certified radiologists, elevating the quality of patient care. Teleultrasound services have now been introduced into equine practice with increasing adoption. Teledermatology is uniquely suited for telemedicine as it is possible in some cases to provide accurate diagnoses and treatment recommendations. Results from telepathology, telemicroscopy, and teleytology have been shown to be in agreement with conventional methods, even exceeding them in some cases. Teleophthalmology is becoming more achievable with development of technologies, including smartphone technology and an indirect ophthalmology lens, as is teleneurology. Veterinarian-to-veterinarian teleconsulting affords mutual support among colleagues.

3. Telemedicine in Veterinary Healthcare
Veterinary telemedicine has been following in the wake of human healthcare. The global veterinary telehealth market size was valued at $92 million in 2020 and is expected to expand at a compound annual growth rate of 19.5% from 2021 to 2028, with a predicted revenue forecast for veterinary telehealth in 2028 of $417.1 million. Whether recognized or not, telemedicine is already an important pillar of nearly all equine practices, from large referral centers to rural practices. Telemedicine is working. While the in-person physical examination will never be replaced, and should not be, telemedicine is an essential component of the continuum of the highest-quality, comprehensive care for equine patients; in fact, telemedicine affords additional “touch points” with both clientele and patients. Telemedicine can offer insights that augment a single in-person visit. Responsible virtual
examination, diagnosis, and consultation, when appropriate, can be legally and effectively incorporated into practice. Another benefit of telemedicine is that it can be useful as an alternative or temporary substitute for in-person visits that need to be cancelled. Telemedicine is being used in equine medicine for an abundance of problems, such as basic triage, dermatology cases, lameness, minor lacerations, colic, basic ophthalmology, progress checks, postoperative follow-up, and long-term care. Telemedicine with video allows the veterinarian to visit the premises virtually with the potential to enhance the examination by observing the horse in its own environment, other animals, grain, hay, feed storage, facilities, level of management, and more. Telemedicine allows access by practitioners synchronously or asynchronously, as the case indicates. Using equine lameness as an example, much valuable information can be obtained virtually. The complete medical history can be recorded and added to the existing medical record. Still images and videos can be transmitted to the veterinarian by the owner, the trainer, or potentially a veterinary technician. With real-time video, such as Zoom, the veterinarian can guide the examination directly, following the American Association of Equine Practitioners Guidelines for Evaluating the Lame Horse, as far down the list as possible. The horse can be examined at rest, observing posture, stance, expressions of pain, weight bearing, swelling, wounds, visible foreign bodies, etc. In motion, video can capture the horse as it walks and trots toward and away from the camera, laterally to the camera, longeing both directions, and under saddle performing its routine exercise tasks. Depending upon the expertise and reliability of the owner or trainer, watching the horse’s response to focal manual palpation, hoof testers, and flexion tests is possible. While more definitive diagnostic tests, like nerve blocks and imaging, cannot be performed virtually, sound judgments can be made about whether the horse must have an in-person examination, and especially how urgent that examination should be. The severity of the lameness and how many limbs are involved can be assessed. In some cases, treatment can be recommended with a well-calculated follow-up plan for treatment and further assessment. One example might be a horse with sudden onset of unilateral lameness soon after shoeing that is positive to hoof testers over one nail and shows no other abnormalities. In such a case, the farrier might be called to check the shoe, in which case the veterinarian and farrier can communicate and the follow-up plan determined accordingly. Other horses may be obvious as urgent cases needing immediate attention, whether on the farm or in the hospital. One instance would be a horse displaying signs of a classic grade-IV laminitis. Another would be a non-weight bearing lameness consistent with a severe injury, like fracture. Ruptured tendons could be suspected because of local swelling and potentially hyper-extension of joints supported by affected flexor tendons. The amount of swelling and pain associated with cellulitis are observable by video, especially the excessive pain response to touch. Obvious muscle atrophy will raise suspicion of a neurologic condition. In each telemedicine case, the veterinarian gleans important information that guides next steps, including emergency in-person visits. In equine practice, rural settings are common, validating a look at the benefits of telemedicine in human healthcare in rural communities, where telemedicine has been shown to be invaluable. The results are improved patient care, patients seeing more specialists with shorter wait times, reduced costs and time required, increased physician utilization, and 100% positive feedback from patients. All these benefits apply to equine practice. Justifiably, equine telemedicine has been referred to as the “new farm call.” Additionally, telemedicine can help address the challenges associated with lack of access to adequate veterinary care in rural communities, especially considering minimal availability of veterinarians concentrating on equine medicine. Some practices have taken advantage of a model in which a central hospital is supported by outposts in surrounding communities that are visited on a regular basis. Telemedicine allows these distant communities to be served daily with more consistency than without telemedicine. Even when mixed-animal veterinarians are located in rural communities, through telemedicine, they have constant access to the best equine-only veterinarians and specialists, as needed. Challenges of access to care pertain to more than just rural communities. There are numerous circumstances in which horses cannot be transported to a hospital or clinic, as there are for veterinarians not able to make the trip to the horse. Veterinary technicians can extend the reach of the veterinarian through telemedicine, depending upon the varying regulations—for example, the definitions of direct supervision. Hopefully, veterinary technicians will be able to be better leveraged in telemedicine services in the future. Monetization of telemedicine can benefit the financial health of a practice and requires a plan for protocols, just as with in-person visits, that are individualized for the practice and/or for its veterinarians. The first step is establishing a defined price structure that includes specific fees for telemedicine examinations. Some recommend setting the telemedicine examination fee equal or comparable to an in-person examination, the latter of which can be waived if the telemedicine examination results in a clinic visit for that problem. Others reduce the fee for a telemedicine examination because the reduced fee can be justified when the telemedicine examination is more time efficient than in person; however, telemedicine can add a layer of time commitment for communications, billing, etc. One must also take into account client convenience and minimizing stress for the patient. The practice will have to determine how it wants to collect payment—for example, credit card, existing online payment programs, credit, etc.—in the most secure manner. An essential component
of the introduction of fees for telemedicine is a robust customer awareness campaign. Clients must be informed of the transition not only to providing telemedicine services in the practice but also to requiring payment for these telemedicine services. Proactive communication and transparency are key. At the time of scheduling a telemedicine visit, clients can be gently reminded of the fees while they are assured that telemedicine meets standards of care and the results are part of the horse’s permanent medical record. Marketing materials can highlight benefits of telemedicine, including its fulfillment of standards of care. When properly explained, most clients will accept these fees, especially when they understand the benefits. The capabilities of virtual examination will expand in concert with the conception and refinement of new technologies. Digital radiology has opened the door widely for teleradiology, with subsequent creation of new job oppor-unities. Teleradiologists can work from any location with vast work schedule options. Digital ultrasound offers comparable options for teleultrasound, including remote teleguidancea (remote ultrasound teleguidance). This ultra portable ultrasound enables real-time remote viewing and image optimization. This can be used for remote consultation as well as education and coaching regardless of the operator’s global location. Telecardiology services have been in place for many years for veterinarians. Today, personal smartphone ECG monitoring devices are used in human healthcare that allow a medical grade ECG anytime, anywhere, and at an affordable price (AliveCor’s KardiaMobile). Eko Duo is a combination ECG and digital stethoscope that is powered by artificial intelligence; Eko has also developed a similar digital stethoscope for veterinarians. Smartphone-based portable ECG devices are currently under development for horses. PonyUp Technologies provides monitoring devices for horses, such as VetCheq, which remotely and noninvasively measures pulse, respiration, and central venous pressure with Bluetooth technology. For teleneurology, an ambulatory electroencephalogram system is in progress for horses with promising results.16 Tytocare allows a full examination at home with physicians able to hear heart and lung sounds, conduct ear exams, see the throat, and receive examination results by secure e-mail. In-home diagnostic kits are flourishing in human healthcare to test for COVID-19, human papilloma virus, HIV, trichomonas, cholesterol, thyroid hormones, allergies, food sensitivities, colon cancer, heavy metals, and more. Zoetis offers a stall-side test for equine inflammation and infection, and TargetVet has stall-side equine progesterone and IgG tests. VetGuardian has developed the first zero-touch monitoring device for veterinarians that measures vital signs accessible by a smartphone. Imagine the benefit to horses, clients, and the veterinary healthcare team when these technologies can be integrated. Conversations within the profession about telemedicine almost always include opinions about the veterinary client-patient relationship (VCPR). In human healthcare, regulations regarding telemedicine continue to evolve, as they are in veterinary healthcare. Today, all states, except one, allow virtual creation of the physician-patient relationship. While the regulatory trajectory for veterinary telemedicine lags behind human telemedicine, there are recent notable changes in veterinary regulations. Michigan and New Jersey just passed legislation to allow a telemedicine VCPR to be established virtually under the judgment of the veterinarian. The American Association of Veterinary State Boards (AAVSB) established guidelines for telemedicine as a model for state boards. Their language reads, “The veterinarian must employ sound professional judgment to determine whether using telehealth is suitable each time veterinary services are provided and only furnish medical advice or treatment via telemedicine when it is medically appropriate. A veterinarian using telemedicine must take appropriate steps to establish the VCPR, obtain informed consent from the client, and conduct all necessary patient evaluations consistent with currently acceptable standards of care. Some patient presentations are appropriate for the utilization of telemedicine as a component of, or in lieu of, hands-on medical care, while others are not.” In other words, the veterinarian’s judgment should be the determining factor. This language supports the notion that veterinarians are intelligent, compassionate, and devoted to their patients. As such, they should be trusted to determine when a VCPR can be formed remotely and when it cannot; most certainly, remote establishment of a VCPR is not always appropriate. Those who oppose the remote establishment of the VCPR offer concerns surrounding the differences between human and veterinary healthcare, including diverse species, unique health risks for owners, dissimilar payment models, and disparate regulations regarding pharmaceuticals and products. As veterinarians use the VCPR, whether remote or in person, they must be especially mindful of the Animal Medicinal Drug Use Clarification Act (AMDUCA), which provides veterinarians acting within the VCPR greater prescribing and dispensing options so animals can receive the medications they need when they need them. It is critical that any relaxed regulations about the VCPR must not create concerns that could jeopardize AMDUCA. One point of consideration is that the AMDUCA requirements for an established VCPR were established long before virtual creation of a VCPR was being contemplated. Conversations with appropriate federal agencies will be necessary to clarify. COVID-19 provided the ultimate experiment for virtual establishment of the VCPR as it accelerated telemedicine in both human and veterinary medicine. State medical regulatory agencies reset many of the barriers to entry for telemedicine, and the experiment has proven beneficial for all. The Veterinary Virtual Care Association (VVCA)
contacted the veterinary medical state boards in those states in which the telemedicine regulations were relaxed to determine if any adverse events were attributable to telemedicine. To date, documented complaints related to telemedicine are essentially nonexistent. The VVCA has also remained in close contact with those in Ontario, where the creation of the VCPR through telemedicine was legalized in 2018. The Ontario VMA has been conducting surveys since COVID-19 forced them to restrict in-person visits. Within 2 months, 90% of veterinarians were using telemedicine. When restrictions were relaxed, > 80% of veterinarians continued to use telemedicine. Their veterinary medical governing board has received zero complaints related to telemedicine. As such, concerns related to the relaxation of the VCPR (and other regulations) seem unfounded, as do concerns about long-term acceptance of virtual creation of the VCPR. When considering and implementing telemedicine into a practice, valid concerns must be considered. The VVCA recently completed a survey asking the top reasons why practitioners were hesitant to implement virtual care in their practices. Regulatory/legal concerns ranked number 1. Other concerns were clients, technology, and staff. All of these can be addressed effectively. Additionally, there are good indicators that clients are willing to pay for virtual services. The value of hands-on examination must never be ignored. Fear of misdiagnosis and liability are trepidations for some, yet others feel they are similar to in-person visits. Communicating via technology is different from face-to-face communications, necessitating preparation and perhaps additional training to be most effective in exchanging information effectively with the appropriate level of compassion and personal touch, which can be achieved. Monetization of telemedicine can be imposing but is accomplishable and generates profits. While technologies are considered assets, they also have limitations. Internet access can be inconsistent, especially in areas with the greatest need. Some veterinarians are apprehensive about the time commitment of implementing telemedicine into a practice and have related questions about transition requirements, alteration of workflow, re-quired staffing, client acceptance, and ultimate cost-benefit ratio. Some have become secure with their current practice model and are reluctant to change. Because younger generations are more comfortable with technologies and have high expectations for their use, multiple generations in the practice can impose issues related to differing expectations for modernization, technology use, telemedicine, etc. State regulations can be restrictive and most certainly lack consistency nationwide. The VVCA was created in 2020 to provide valuable resources to veterinarians while ensuring that virtual care becomes a part of the standard of care by advocating best practices for veterinary healthcare providers. These best practices are under constant revision and can be found on the website at https://vvca.org. Some of the website features contain a quick-start guide, guidelines for telehealth, best practices for telemedicine, best practices for legal and ethical issues, a client consent form, workflows and decision trees, a front-desk phone guide, blogs, videos, and current newsworthy items. Comparative policies of the American Veterinary Medical Association, American Association of Veterinary State Boards, and Veterinary Innovation Council feature organizational views. A very useful tool is the constantly updated veterinary telemedicine regulatory map showing current regulations for each state. Increasing access to veterinary healthcare is a core responsibility for all in the profession. By effectively leveraging simple technology, practices can significantly improve patient outcomes (earlier diagnosis and treatment), owner compliance, client satisfaction, and loyalty. Telemedicine can increase the time efficiency and productivity for the practitioner. An additional revenue stream is captured, while reduced cost to clients in some cases and improved access to care and improved outcomes and satisfaction for all stakeholders can be realized. Telemedicine is not meant to replace the in-person patient exam, and in many cases it cannot. It may, however, allow a triage for those cases to determine and schedule an in-person veterinarian visit, when indicated; in fact, it has been shown that telemedicine stimulates substantially more hospital and in-clinic visits. Veterinarians historically have given away many of their services while powerlessly watching a number of revenue streams be stripped away. Telemedicine offers a viable path to monetize their valuable services, recapture some lost revenues, and do so by leveraging their medical training and that of their professional staff. In the end, veterinarians have the option to choose telemedicine, and if they do not want to offer telemedicine services, they should not; however, new associates may seek practices that use telemedicine. If animal owners do not like telemedicine, they will not use it; however, if they do like it, they will find a practice that offers it. An essential point is that telemedicine will not turn good veterinarians into bad veterinarians. It has been said that technologies will not replace doctors/veterinarians, except those who do not use them. Telemedicine is here to stay; can be leveraged to benefit the patient, client, veterinarian, staff, and practice; and can contribute to veterinarians being better caregivers to the animals to which they have dedicated their lives.

4. Recommendations

1. To get started, seek resources such as TeleMed Best Practices, Legal and Ethical Issues; sample client consent forms, front-desk phone guides, and prescribing medications; as well as sample telemedicine flow charts that can be found on the VVCA
website. Also, ask for advice from colleagues who have successfully integrated telemedicine into their practices and learn from continuing education offerings.

2. Thorough and updated knowledge of your individual state regulatory landscape is fundamental in planning and implementing a telehealth program in your practice. The VVCA has a regulatory resource map where your state can be selected and updated regulations for veterinarians are accessible. Once you are familiar with what is and what is not allowed in your state, you can create a roadmap for your practice. See the resource guides from the AAVSB regarding Vet TeleMed where you practice.

3. Determine the most appropriate inclusion of staff in offering telemedicine services in your practice, e.g., veterinarians, veterinary technicians, front-office staff, billing office, practice managers, etc. Engage them all in crafting a workable plan that is most likely to be well received and successfully adopted.

4. Provide training as necessary for the practice as a whole and for individuals involved in different aspects of your telemedicine services. One example is communications training to ensure that communications via technologies convey the practice culture desired. Another is the individual roles and responsibilities with seamless incorporation of each 24/7.

5. Plan on the structure inside your practice for managing calls, veterinarian’s response, scheduling, billing, medical record entry, etc. as well as an evaluation of charges/value for telehealth—time base (10 minutes vs. 60 minutes), by the job (prepurchase radiograph evaluation), etc.

6. Establish and maintain policies and procedures for medical records generated through telemedicine. This includes the secure transmission of records. Create an integration pathway to link your existing medical record program to your telehealth records or explore add-on programs available to facilitate and streamline that process. Ensure confidentiality of telemedicine records.

7. Implement practices to maximize cybersecurity and minimize cybercrime regarding medical records and data management. This applies to all practice information, not just telemedicine.

8. If a platform vendor is preferred, ask many questions before signing on, such as their level of confidentiality, the extent of their insurance coverage, how they manage and use their data, etc.

9. Ensure that connectivity, equipment, and processes are working and then double-check them frequently. Obtain client and staff feedback to continually improve processes.

10. Inform your malpractice insurance provider of the inclusion of telemedicine practices in your practice and obtain confirmation that they are covered.

11. Evaluate how much and what type of telemedicine you are currently providing, e.g., triage, rechecks, telemonitoring, remote diagnosis, etc. Determine the value to the practice of each. Also, evaluate what circumstances have been gratis, what circumstances should be/should have been billed, and what the value of those services is. What questions can be answered by staff or should be answered by a veterinarian? What is “good will for a great client” as these and many others are certainly individual for different clients and different practices? Many of us have a history of undervaluing the worth of our time and expertise as well as underestimating the willingness to pay of many of our clients. There are circumstances in which friends seek advice from colleagues as they do not want to bother their own veterinarian/friend, knowing they would not be billed by them; they want to pay a veterinarian so they could ask more questions.

12. Define the possibilities and limitations of remote diagnosis in your practice.

13. Obtain written client consent before the telemedicine visit. The VVCA offers a list of concepts to be included in this form.

14. Educate clients about the option of telehealth for their horses and its many benefits. Obtain client feedback as many will have already experienced telemedicine for their own healthcare. Early engagement of clients will set up the expectation for charges, as well as the gentle nudge for “the value of a veterinarian’s time.”

15. Add telehealth promotion and education to your existing market plan to increase awareness that your practice offers this service in the continuum of care practice paradigm.

Acknowledgments

Declaration of Ethics

The Authors have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest

Dr. Green serves on the board of Vet Guardian. Dr. Markell is a consultant for Butterfly Network.

References and Footnote


"Butterfly Networks iQ Vet + (https://www.butterflynetwork.com/vet/teleguidance-vet)."