Chapter 9
Education in Virtual Care Delivery: Clinician Education and Digital Health Literacy

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When layered together, the sharing and integration of information to create knowledge is radically altering our traditional approach to the production of all goods and services. Individuals are now empowered to bypass traditional avenues and methods of resource access (e.g. transportation, housing). Even the knowledge traditionally held by certain professional categories or trades (e.g. lawyers, architects—and, yes, even physicians) is now open, accessible and free. Digital technologies and capabilities have already begun to dramatically alter our approach toward solving traditional problems by enabling new applications of innovation and creativity in specific domains. For the healthcare community—the information revolution is creating a profound reconsideration of the who, what, where, when and how of the entire health care delivery model.

Information and knowledge sharing are the underlying forces for driving transformative change in healthcare. This phenomenon coupled with the diversification of the workforce, emerging technologies and the march towards alternative payment systems designed to foster value-based care delivery, are precipitating new models of care delivery throughout the world.

Cardiology is not isolated from the many changes sweeping the healthcare landscape. In fact, the reliance of the specialty on the digitization of information to support accurate diagnostic and treatment approaches has only accelerated in recent years. What started as a mere computerized analysis of the EKG in the formative years of the information revolution has turned into augmented intelligence during all manner of cardiovascular procedures. The end result is an increased need for

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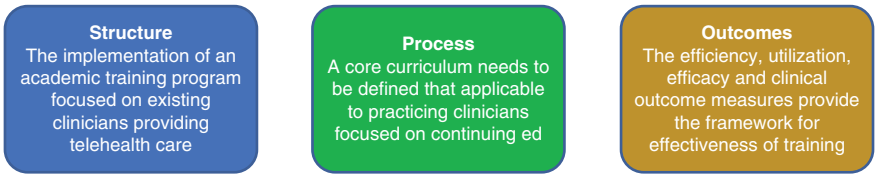

Fig. 9.1 Steps for successful development and implementation of telemedicine education

effective education regarding the capabilities and trends of cardiovascular digital transformation.

Education regarding cardiovascular digital transformation is necessary for several industries. It is important for the general cardiologist to first understand what health IT looks like today, which areas are most promising for forward progress in cardiology and how to take advantage of these technologies. Health system executives are assessing the opportunities to change the infrastructure of cardiovascular care delivery. Nonprofits and private equity are actively seeking out medical expertise and evaluation of which technologies will improve healthcare through addressing social determinants of health centered around access. Broadly available education also allows entrepreneurs in digital health to identify where the challenges lie in incorporating IT and engaging providers in adoption which has been a long-standing challenge for the digital health world (Fig. 9.1).

9.1 A Brief Exploration of the Transformative Forces Affecting the Delivery of Healthcare

The pace of change we are witnessing in health care requires a reassessment of our approach toward the training of medical and health sciences clinical providers. These changes will only accelerate in the coming decades as the Digital and Information Revolutions continue to evolve. What are the major factors causing the revolution in health care?

9.1.1 Economic Globalization

Every nation in every region of the world is seemingly interconnected as a result of technology. Witnessing the recent global pandemic that was not sequestered in one place but spread across the entire world, caused economic as well as care delivery ripples. Economic globalization by its very nature, triggers an unremitting reexamination of cost structures related to the production of all goods and services across multiple industries. Healthcare is not immune to these changes. As the use of virtual care technologies expand, some authorities are predicting the "internationalization" of health care delivery much like we have seen in areas of the economy [1, 2].

9.1.2 Cost of Health Care

The strain on the federal budget from Medicare/Medicaid (26%) and Social Security (24%) [3] alone is resulting in political backlash from other sectors requiring federal or state government support. With the recent debt incurred by the COVID-19 pandemic, these pressures on local, state and federal government will only increase. It is an increasingly recognized imperative among the political establishment that the escalation of healthcare costs must be reined in and managed more effectively.

As technologies such as Bluetooth enabled devices, ambient pressure monitors and wearables are now able to track the weight, vitals and respiratory fluctuations continuously in patients allowing for much earlier diagnostic interventions to prevent high cost care delivery in emergency rooms and hospitalizations. Appropriately deployed technology can alter this pattern by using various technology-related resources that create increased efficiency, enhanced effectiveness, improved quality and better outcomes.

9.1.3 Societal and Provider Demographics

Societal demographics are shifting across the world. Over the last century, the average life expectancy for individuals has increased dramatically. The United States has not been immune to this trend. According to the U.S. Census Bureau, the country is "aging". Over the period between 2012 and 2050, the number of people aged 65 will have grown from approximately 43 million to nearly 84 million individuals, with the Boomer generation representing the bulk of that growth [4].

9.1.4 Shifting Reimbursement Models

For much of the last century, healthcare in the U.S. has been based on a fee-for-service (FFS) payment model. Although the exact trajectory is not yet clear, the movement in a new direction toward value-based payment models in care delivery seems imminent. Such a shift will inevitably result in a change of how groups of physicians and hospitals operate with the result that quality, efficiency, and effectiveness outcomes likely to dominate the models for care delivery.

9.1.5 Social Determinants of Health

There is an increased recognition that the social determinants of health (SDOH), are major factors in predicting outcomes and quality of care. The CDC recommends focusing on five key areas across the SDOH continuum, including: (1) economic stability, (2) education, (3) social and community context, (4) health and health

care; and, (5) neighborhood and built environment. These key considerations represent the major contributing factors related to the overall health of individuals and the community as well as the eventual cost of care. In addition, it is now widely recognized that a sixth dimension must also be considered as a key element for addressing social determinants—addressing cultural competencies and health disparities [5, 6]. The move toward values-based payment and delivery models coupled with a solid foundation integration of the six major social determinants is another transformation force altering the future of care delivery.

9.1.6 Rapidity of Technology Advancement

Biotechnology, genomics, nanomedicine, robotics and changes in pharmaceutical development are a few examples of many breakthroughs occurring in healthcare. The pace of change and its direct impact on the delivery of care is quickening. The capability of medical devices, drugs and delivery mechanisms and their impact on where and how care is delivered is far greater today than at any point in human history, and their future impact will be highly significant.

One area of technology use that is now at the forefront is the application of telehealth services. Interest in the use of virtual care delivery models was slowly increasing until the global pandemic when there was a precipitous increase in interest us the use of telehealth and virtual visit services.

9.1.7 Summary of Driving Forces

All these forces are driving a disintermediation of the entire care delivery process and must be addressed by healthcare organizations. While the list is not exhaustive, these forces are requiring the industry to rapidly adopt improvements in its value proposition through transformation. To assure that the results of the healthcare enterprise are "safe, effective, efficient, timely, patient-centered, and equitable" [7] as well as beneficial. Meeting these challenges requires leadership at all levels and a basic reconfiguration of the care delivery model. Virtual services will no doubt be a central component as care delivery models are redesigned over the coming decade.

9.2 Education and Training: Requirements for Virtual Care Delivery

One of the major impediments to expanding virtual care delivery is insufficient formal training for clinicians related to the application, use and benefits of utilizing these new and evolving virtual technologies. Healthcare providers across all

specialties, will require training in telemedicine skills to meet the demands of digitally empowered patients as well as to deliver care in the new digital age of medicine.

There is an immediate need to define the requirements of a core curriculum in telemedicine training. The four main components will include continuous remote monitoring, individually relevant predictive algorithms, asynchronous patient data and virtual video visits, which form the foundation for sustainable telemedicine care. Over time, specialties such as cardiology, which are remarkably data driven, will witness even more changes through the application of machine learning and artificial intelligence.

9.2.1 What Training Will Virtualist Care Clinicians Require?

Virtual clinicians and care providers will not typically be co-located with patients and other members of the health care team. Therefore, their training must emphasize specific competencies in leading and participating in interdisciplinary teams distributed across multiple workspaces and environments. Training in informatics, analytics and population health will prepare virtual providers to separate signals from noise in large dynamic sets of patient data, allowing decisive action without the absolute requirement of the traditional physical examination. Although formal training in the above domains will become more prevalent as all medical specialties and health care fields adapt to the demands of the information age, deeper competencies in these fields will differentiate the virtual health clinicians from care providers with a baseline or generalist level of virtual skills training (Table 9.1).

9.2.2 Elements of Virtual Health Care Training: The Core Curriculum

The core curriculum for virtual care delivery has been established and revised by several national organizations. Each emphasizes providing clinicians the knowledge required to successfully deliver basic virtual care. Specialized tracks and advanced training in the nuances of care delivery, devices and data analysis will evolve over time.

American Medical Association (AMA) adopted the policy in 2016 during its Annual Meeting to encourage the adoption of telemedicine training for medical students and residents. While the policy specifically encouraged undergraduate and graduate medical education accreditation bodies to include core competencies for telemedicine in their programs, no such formal guidelines have been forthcoming to date. Furthermore, the AMA recommendations were restricted to the concept of telemedicine and did not include consideration of telemonitoring and telecare, two important elements of the proposed telehealth educational framework.

Table 9.1 Four critical principles for developing and deploying a virtual health training program

1. Interdisciplinary/ Interprofessional/Team-based care is an essential modality in a virtual environment.	In a value-based approach to health care delivery, the importance of a fully functional and integrated team approach becomes an essential component of the care provider team. The essentials of team development, inter-professional communications and use of virtual capabilities in such environments must be a focus for the training of health care virtualists.
2. Clinically augmented intelligence is a capability, not a replacement.	The intent of virtual health care training is not to replace clinicians but to arm them with the tools and technologies that can clearly augment their capabilities in providing quality, cost-effective care. Therefore, how virtual tools are effectively integrated with face-to-face care delivery is an important element in the education of virtual health care clinicians.
3. Telemedicine skills apply across the continuum of health professionals	In adopting virtual care models, it is important for all care delivery professionals to understand how, when, where and what virtual tools should be used in augmenting the care of the team. Therefore, training is not restricted to just a few clinicians but is encouraged for all members of the health care team.
4. Inter-institutional collaboration will accelerate the ability of higher education to respond to the shifting care delivery environment.	A comprehensive approach is required if clinicians are to be provided the breadth of training required to shift from traditional face-to-face models of care delivery toward the integration of virtual health models. Many residency programs are hospital-based in non-academic settings or in academic settings without the requisite talents in all the proposed domains. In such an environment, collaboration among the health science training programs of the nation should be considered a mainstay of implementation.

In the absence of clear accreditation requirements by the medical education community, the American Telemedicine Association adopted an Accreditation Program for Online Patient Consultations in 2015. The focus of the accreditation requirements; however, is on the more operational aspects of telemedicine including patient safety, transparency of operations and adherence to all relevant laws and regulations. The academic training requirements for clinicians providing such services are not a component of the overall accreditation program.

What if I miss something? The fortunate aspect of virtual visits is that follow up is always possible in some format. Sequential virtual visits, in-person visits, vital signs from home, ordering or reviewing labs and imaging, and leaning on local care providers are all mechanisms to ensure that a virtual visit never stands alone as a patient evaluation tool if there is clinical uncertainty (Table 9.2).

Digital assessment tools will be essential in the future of at-home assessment. Physical metrics such as frailty assessments can be performed in patients' homes using technology or over video and may significantly influence prognosis. Moving

Table 9.2 Conducting a virtual physical exam

Video physical exam
General: Appearance, distress, home environment, visual medication reconciliation
HEENT: Oropharynx, extraocular movements, sclera
Chest: Respiratory rate, retractions, cough
Cardiac: JVP, radial pulse
Abdomen: Visual inspection, tenderness to palpitation
Extremities: Cyanosis, clubbing, edema
Neuro: AAOx3, cranial nerve exam, gross motor, drawing for fine motor
Psych: Behavior, speech, mood, affect, family dynamics

quickly to validate virtual, at-home frailty assessment is another example of existing will enable us to map a patient's specific healthcare needs.

Preparing for Successful Provider and Patient Experience in a Virtual Visit

1. Create a comfortable environment and the right ambiance while avoiding provider frustration with the connection. Pre-visit, educate clinicians regarding optimal lighting (avoiding backlight, using an extra light source), and strong connection (ensure Wi-Fi connection as well as network access). Have a colleague review their workspace virtually to notice what scene the background creates. As the visit commences, educate clinicians to ask the patient if they can see and hear them clearly before beginning. Have at-the-elbow tech support ready when needed as well as a back-up stand-alone platform for phone or video should the technology become frustrating for either party.
2. Make sure patients can connect and arrive with ease. A unique feature of virtual visits is logging in from the comfort of home. Avoiding discontent with the log-on process optimizes this advantage. Practices with medical assistants should train them as part of the workflow to call patients for test visits in advance. It is the clinician's responsibility to educate the medical assistant as to what information they may also want in advance of the appointment that a medical assistant could obtain (i.e., medication reconciliation, social and family history review, chief complaint or concern for the visit, refill requests). Unique accommodations should be noted, including interpreter services, caregiver inclusion, and audiovisual or learning impairment. At the same time, medical assistants should ask patients if they have BP monitors, a scale and other tools to enhance their virtual experience. If so, patients will be asked to upload the data prior to their telehealth visit.

9.3 Educating the Virtual Educator

Virtual education requires clinicians to alter the mechanism by which they teach. A virtual educator, whether teaching a patient and their family or fellow clinicians or trainees needs to serve as designer, director, animator, writer, content expert, engagement expert and communicator (Table 9.3). These are skill sets that one must now adopt in addition to clinical acumen and patient rapport. When taught correctly however, the effect of a good virtual educator is exponential on patient engagement, self-advocacy and compliance. Teaching these skills internally in a clinical practice, telemedicine company or academic medical institution is more challenging than outsourcing skill advancement to the many presentation skill building services available globally. For individuals who have a penchant for large volume virtual clinical practice, we strongly recommend bolstering their bedside manner with formal training in screen side manner as well.

When engaging with individual patients, or patients and families or caregivers, professional set-up, adequate lighting, confirming clear audio and video are the baseline goals as reviewed. Increasing engagement is the next goal with visual diagrams for education, screen sharing of cardiac imaging with basic live annotation to decode complex echocardiography or MRI, and whiteboard use to write out the key action items for the visit can engage patients with auditory, visual and written cues to adapt to all learning styles.

In the setting of group virtual visits, or virtual education of colleagues, additional engagement tools including audience polling, use of breakout rooms, live annotations and sketching, sticky notes for collaboration and repeated use of a concise messaging slide to repeat key goals or educational points. Depending on the situation, including Ted-style storytelling to draw in the audience can also be an effective tool for virtual engagement. Lastly, in challenging virtual patient group interactions or clinical settings, audience synchronization (i.e., simulating a room with participants sitting around a table) and blending physical and virtual interaction (i.e., "passing a ball" to the next speaker) can be useful tools for group engagement.

9.4 Educating the Patient: Digital Health Literacy

Digital health literacy can be defined as a set of skills, knowledge, and attitudes that a person needs to engage with, comprehend and apply health information to their own care. Improving digital health literacy can increase engagement with and the efficacy of virtual and telehealth-based preventive, chronic disease management and acute care in an informed manner. While many adults globally own smartphones, having access to a video- and data-enabled device does not guarantee having the digital skills to use a specific video application to conduct a visit [8]. Lack of broadband access may also be a barrier to video visits, as broadband often facilitates better video quality and does not usually come with a monthly cap on data as seen

Table 9.3 Minimum baseline for training clinicians as generalists in virtual care delivery

Health informatics (HI)	Information engineering for managing and using patient care information. According to HIMSS, the Healthcare Information and Management Systems Society, HI promotes the understanding, integration and application of information technology in the health care setting to ensure adequate and qualified support of clinician objectives and industry best practices.
Artificial intelligence/ machine Learning	Systems used in artificial intelligence and machine learning are expanding and moving in new directions as the technology continues to evolve. As a result, the area is dynamic and requires both an understanding of current capabilities, directions of research and possible derivative capabilities that could evolve from integration of multiple, independent data sets.
Social media	Integrating social media and health care data is required to more effectively track and intervene in the consumer health care experience and identify population health trends on a real-time rather than retrospective basis.
Immersive media	Health care is experiencing technological disruption and the adoption of immersive media tools as a part of the transformational change in care delivery. Immersive media—including virtual reality and augmented reality—are broadening how people learn and heal and how we can facilitate and accelerate their behavioral changes. The use of immersive media environments holds the potential for accelerating behavioral change in patients by supporting education on all aspects of medical, health and/or social considerations that play a role in the health of individuals.
Psychology of virtual Communications	Many industries have benefitted from recent advancements in the use of video communication technologies. These new capabilities have allowed individuals the opportunity to express their perspectives, ideas and concerns in ways that may not present in as forthcoming a manner as direct, in-person communications. However, the health care field is only at the nascent stage of using these new tools. As face-to-face communication lessens and as health care adopts more virtual communications, the need for training in the best approaches to avoid the potential for miscommunication from the use of texts, chats, e-mails and other forms becomes apparent. Virtual care providers must learn the psychology of these virtual communications tools and how they can affect the patient-clinician interface.
Inter-professional and virtual team management	Many organizations across multiple industries have learned that it is important to focus on effective team management in virtual environments. Issues such as process and task clarification, establishing a communication charter, use of communication technologies and shared language and nomenclature are but a few of the examples of areas where cross-team training is required. Handoffs within, across and beyond the team are particularly important for virtual care providers since these handoffs can have a direct impact on the care of the individual patient.
Remote care delivery and operational requirements for supporting virtual care delivery	This area of is quite dynamic with new technologies emerging at an increasingly rapid pace. Students will learn the best approaches for effective analysis of the latest research in the rapidly evolving virtual remote care delivery space, a prime consideration in this section.

(continued)

Table 9.3 (continued)

Technical Innovations and trends	It is very clear that health care's technical evolution has often been far ahead of the practical application of its tools and technologies. Virtual health care providers must become more expert in evaluating such technologies to assist their organizations in determining the appropriateness of deployment.
Frameworks for effective technology assessment	As virtual technologies move into mainstream health care, virtual care providers will be called upon to assist their organizations in assessing technologies to improve efficiency, access and quality of health care, as well as how to deploy such tools in support of care delivery. The interests of such clinicians will naturally shift towards evidence-based medicine, comparative effectiveness research and health technology assessment (HTA) tools. Therefore, virtual care providers must be adequately trained in the systematic approach to evidence, relevant outcomes in support of care delivery, and other dimensions of technology and the frameworks used for supporting such assessments.
Legal, regulatory, privacy and security requirements	As the field evolves, understanding the changing dynamics of the oversight requirements and overarching strategic confidentiality of information derived through virtual systems must be a core area of understanding

with cell phone plans. Even when accessible, many patient-facing web pages, medical health records accessible through online portals and mobile health applications are not optimized for patients with low digital health literacy [9]. Age, educational attainment, digital literacy and health literacy independently, health status, trust in healthcare and digital information, their motivation for seeking information, accommodations for limitations, and ability to co-engage with family members or support persons are among the key factors which influence digital health literacy and must be addressed in the infrastructure of digital health tools and sites during their design [10]. Approximately 25% of Americans do not have the digital literacy skills or access to the technology required to engage in video visits.

9.4.1 Health Literacy

Health literacy is the degree to which individuals are able to access and process basic health information and services and are thereby able to participate in health-related decisions. Limited health literacy is highly prevalent worldwide and is strongly associated with patient morbidity, mortality, healthcare utilization and costs. It has also been associated with limited knowledge of health conditions and medications, poorer overall health status, higher healthcare costs, and increased likelihood of rehospitalization and mortality. Online medical education, technical instructions, and any self-scheduling mechanisms when offered only in English, presents a significant barrier to care. In cardiovascular disease, health literacy is an invisible barrier to healthcare delivery that has profound costs for individual and public health. It has been associated with poorer outcomes preceding and following coronary events and is associated with

30-day readmission after acute coronary syndromes. In individuals with heart failure, limited health literacy has been associated with 1.3- to 2-fold higher all-cause mortality in hospital and community-based cohorts. Individuals with limited health literacy experience barriers to referral to, engagement with, and participation in cardiac rehabilitation services and thus miss the physiological and non-physiological benefits after coronary events. Multisession telephone-based intervention for individuals with heart failure led to a lower likelihood of hospitalization. A cross-sectional study of 402 patients from 2 racially diverse and geographically distinct public, urban healthcare facilities found that the majority (55%) of individuals with inadequate health literacy were not able to recognize a blood pressure of 160/100 mm Hg as abnormal.

Interventions addressing health literacy in individuals with CVD have focused primarily on medication adherence including reminders, illustrated medication schedules, and even pharmacist assisted medication reconciliation and counseling. Telephone follow up appears promising as well. The addition of video, the ability for a clinician to see how medications are stored, assist with labeling real time, review storage location and incorporate caregivers in the conversation from home, may all prove to address health literacy in a more tangible way.

Chat messaging using smart phones has evolved as a mechanism to provide direct feedback and patient engagement (https://www.ahajournals.org/doi/full/10.1161/CIRCOUTCOMES.119.005805) (Table 9.4).

Individuals with limited health literacy face challenges in accessing and navigating health care, and such obstacles may be exacerbated by family, community, and social factors. Only 12% of US adults have the health literacy skills to navigate its complexity

Table 9.4 Examples of text messages used in the CHAT-DM randomized controlled trial

General information on CHD and DM [1×/wk] Diabetes is not terrible and there are many things you can do to prevent problems from diabetes, such as monitoring blood glucose, watching your diet, keeping fit, and taking pills regularly.
Glucose monitoring and control [1×/wk] Afraid of testing blood glucose because it hurts? Try to test on the sides of your fingertips or rotate your fingers, which can help to minimize pain.
Blood pressure control [1×/wk] Home blood pressure monitoring is highly recommended! You can get an accurate picture of your heart health and understand daily changes in blood pressure, which is helpful for doctors to adjust medications for you.
Medication adherence [1×/wk] Taking diabetes medications or injecting insulin regularly can help control your blood glucose level. Forgetting to take your medication? Try to set a repeating alarm on your cell phone to remind you to take medication or insulin injection.
Physical activity [1×/wk] Regular exercise is important for managing diabetes, physical activities such as aerobic exercise and strength training can help you to make your body use insulin better and reduce the risk for heart disease and osteoporosis.
Lifestyle recommendations [1×/wk] The sugary drink may have an adverse impact on your weight and blood glucose. Try to drink water as it is simply the best choice when you are thirsty.

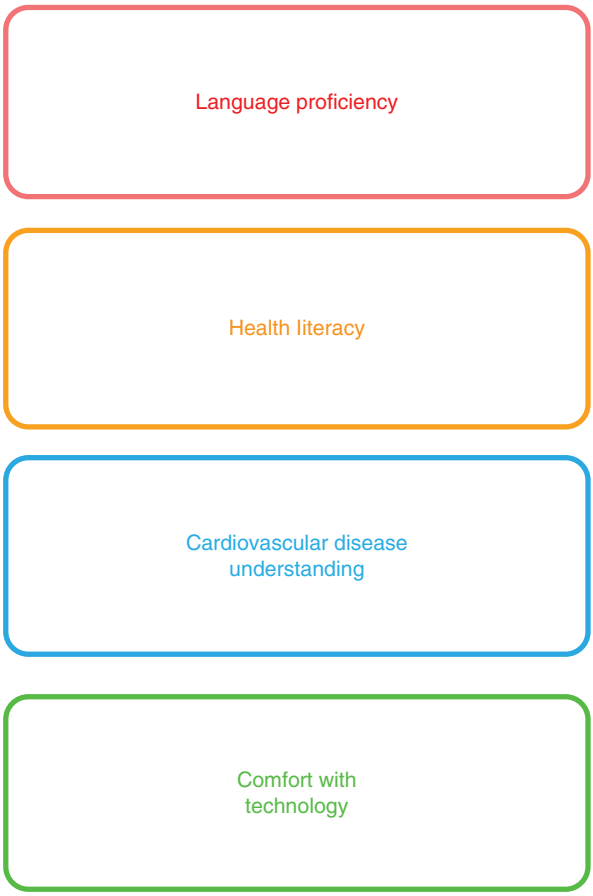

Fig. 9.2 Components of digital health literacy

successfully [11]. The AHRQ Universal Precautions Toolkit for Health Literacy is a publicly available document focused on improving quality of care. [12] It identifies the attributes of a health-literate organization and provides guidance for cardiovascular centers. The American Heart Association has also authored a scientific statement [13] on health literacy in cardiovascular disease. In that they suggest strategies that address barriers created by limited health literacy on the management and prevention of cardiovascular disease which are applicable to practices offering telemedicine and digital technology companies developing platforms or devices for telehealth care alike (Fig. 9.2).

9.5 Summary

New technological capabilities, advances in virtual care delivery, changing societal expectations and a burgeoning demand for basic care services have created a new venue for care delivery outside of traditional face-to-face environments (Table 9.5).

Table 9.5 Future trends in health sciences training

Virtual care training will become embedded in health sciences education	It is highly likely that virtual training will become a core element of the formal education of all medical and health sciences students. As the trend evolves, further specialization in the use of virtual technologies and applications will also evolve.
A continuing education initiative is critical to bring the existing health care workforce up to speed	Certificate programs and specialty updates will no doubt be required for practicing clinicians. Industry-focused training programs on specific tools or platforms may be an insufficient foundation for adequately preparing clinicians to serve as virtual care providers.
Augmented training requirements for specialized virtual medical and health providers	Presently, there are no formal graduate-level training and/or research programs that have been identified in virtual health and care delivery. However, it is anticipated that, within a few short years, such programs will evolve.
Certification of clinicians in virtual health and care delivery will become the norm for individuals involved in virtual care delivery environments	Certification programs within the health care community have been shown to ensure the competence of professionals through a measurement of skills and knowledge with a defined minimum standard.

In addition to educating the clinicians, improving upon health and digital literacy will be essential to patient engagement and improving outcomes with blended care.

Just as physicians and other clinical providers receive a defined grounding in the critical specialties, so they should also be trained in virtualist care capabilities. The purpose of a virtual care training program must be to assist clinicians in understanding common problems and in determining when it is important to seek more traditional as face-to-face care delivery or the assistance of specialists. Further training and skill development are required for all physicians and clinicians who will engage in virtual care delivery so that a baseline of that capability will be a requisite training requirement among all providers. The constant evolution of virtual care paradigms will require modular education offerings ranging from conducting video visits to interpreting patient derived data.

The move toward embracing the virtualist model is an inevitable and essential shift for all medical and clinical professions. The field requires a collaborative approach toward development, implementation and deployment of a rapidly evolving technical landscape. Such collaboration should include universities, associations, industry, health care systems and clinicians as the field of virtual health care continues to evolve and develop.

Case Report

The lead author has served as the driving force for creating a program in virtual care delivery for clinicians involved in providing virtual care delivery. He along with several colleagues in the telehealth and telecare space observed in mid-2015 that the utility of various tele-technology tools was hampered by the fact that front-line clinicians and providers of care who used those tools were inadequately trained. In essence, care providers were often provided very superficial orientations on the technology without any grounding on the utility of the tools or how those tools altered the care delivery process. These observations led to the conclusion

that a need existed for a better grounding in telehealth and telecare capabilities. Furthermore, with the pace of change occurring in the industry, a solid grounding in the utility and capability of these tools was becoming increasingly apparent as the technologies continued to expand their delivery capacity.

As a result, in early 2018, the lead author convened a number of thought leaders in the telehealth and telecare industry to discuss the need for and elements of an essential training foundation for clinicians engaged in providing virtual care delivery services. Those formative discussions provided the framework for the ten (10) essential elements of training required for clinicians providing virtual care outlined in this chapter. In addition to the curricular framework, the participants also felt that a program in virtual care delivery should be structured as a *continuing education* initiative rather than as an ancillary degree. Furthermore, the group felt that the capabilities outlined in the core curriculum should be made available to all health care professionals providing clinical support in patient care settings.

Through the remainder of 2018, discussions were held with a number of informatics and health sciences programs across the nation on the feasibility of establishing a "consortium" of schools who would actively support and develop the program. Over time, the complexities of inter-academic collaboration were recognized as an impediment toward a timely implementation of the training program. In the end, Northeastern University based in Boston, Massachusetts stepped forward and indicated a desire to push the initiative forward with the intent that if schools wanted to collaborate in the future, they would welcome their participation. Northeastern University then proceeded to move forward by investing in curricular development and identification of both internal and external resources that could be mobilized to support the proposed curriculum. As of this writing, the Alpha Cohort of participants at Maine Health is completing the program with very positive results and a Beta Cohort of participants from a variety of health care organizations will be initiated in early 2021.

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