Creating quality clinical experiences while physical distancing is recommended

CAE

Contents

Introduction

COVID-19 has changed learning for the foreseeable future. Twenty-eight million Americans have cancelled their education plans and one in five have made changes to their plans.[36] More than 3,200 higher education institutions in the United States were impacted during the spring of 2020. For most, the impact has come from a transition to online and distance education, as recommended by the Centers for Disease Control (CDC)[6] —98% of higher education institutions moved most in-person classes online, with 43% of higher education institutions investing in new online resources to accommodate online and distance education.[10]

The educational impact has been experienced globally. As of April 2020, schools and higher education institutions were closed in 185 countries, affecting more than 1.5 billion learners, constituting 89.4% of total enrolled learners.[19] As countries around the world closed physical campuses at higher education institutions, online and distance education became the new normal, bringing new challenges to light, such as equity, infrastructure and academic capacity.[38]

These sweeping changes to higher education have been necessary to protect students, faculty and staff.

In addition to governmental guidance, a working paper from Swarthmore College and the University of Pennsylvania modeling the spread of COVID-19 in a large university setting, finds that "moving classes of more than 30 students online is a very effective measure to avoid infections."[2]

Although adoption of online learning has skyrocketed during COVID-19, online and distance education is not a new idea. Correspondence education began in the 1700s, universities in the 1800s started to offer extension services and technological advances in the 1900s enabled schools to start broadcasting education via radio, TV and beyond.[13]

Today, a myriad of technology options such as WebEx, Zoom and Microsoft Teams have made the delivery of online and distance education readily accessible. However, classroom- or lecture-style learning is not necessarily an easy transition for those who had not planned on teaching or learning via distance education. The challenging part of transitioning to online and distance education is that it is not nearly as simple as it might seem on the surface.

Learning virtually is not the same as in-person learning—there are different demands on focus, attention span and managing the strain of motion. Humans often want to learn in an environment with peers, where ideas can easily be exchanged. Online and distance education requires different thinking, teaching style and technology to create learner-centered environments.

Online and distance education for healthcare learners is more difficult to recreate in a virtual environment since there are often more stressors in an in-person environment. In addition to using virtual alarms, chatter from fellow students and other techniques during an online session, areas of study that typically require hands-on training—like healthcare—have resulted in more extreme changes like cancellations and adjustments to learning requirements.

> "Healthcare tends to realize the nuances of historical data. Complex disease processes often drive change. So, we need to focus on how we can help people to prepare. We are committed to providing just-in-time education and training for facilities to manage highly complex, communicable patients, plus current and coming healthcare workers."
>
> Amar Patel,
> DHSc, MS, NRP, CHSE, FSSH
>
> *Chief Learning Officer,*
> *CAE Healthcare Academy*

Concerns for clinical learning during COVID-19

In-person clinical experience has always been integral in preparing healthcare workers for the field. However, COVID-19 has created an environment where in-person contact with those outside of your household should be limited.[6] Additionally, healthcare facilities need to keep a close eye on the supply of personal protection equipment for licensed care providers to handle increased numbers of patients coming in for testing and treatment of COVID-19.

These concerns have contributed to decisions like the Association of American Medical Colleges strongly supporting temporary suspension of clinical rotations, and voluntary—rather than required—participation in direct care of patients.[1] In Australia[29] and Canada[37], clinical placements have largely been suspended. In the UK, nursing students have been given the option to voluntarily opt-in to paid clinical placements.[5]

Other teaching hospitals changed protocols for how many people can participate in in-person rounds—meaning some students use technology to attend rounds remotely. Aside from the disappointment students might experience from having to change or cancel clinical opportunities, a study of medical students in the United Kingdom (UK) also finds these type of disruptions have had an effect on students' confidence and preparedness.[9]

Despite these challenges facing clinical learners, as total cases of COVID-19 and associated deaths continue to increase,[8] the demand for healthcare workers is stronger than ever. Prior to the coronavirus outbreak, healthcare jobs were projected to grow 14 percent between 2018 and 2028—faster than any other occupation.[34] Even with this projected growth, the State of the World's Nursing report from the World Health Organization calls for the creation of at least six million new nursing and midwifery jobs by 2030 in order to provide equitable coverage.[23]

This increased need for qualified healthcare professionals, combined with the need to maintain health and safety for healthcare educators and learners has prompted some states to revisit requirements for gaining clinical experience.

Updated guidelines to achieve clinical proficiency

The means to confirm knowledge and field readiness are evolving globally as a result of the environment created by the pandemic.

- In the UK, the Nursing and Midwifery Council allowed student nurses in the final six months of their nursing program to join a temporary register of those eligible to practice during the COVID-19 pandemic.[25]
- The Federation of Medical Regulatory Authorities of Canada agreed to allow qualifying final year medical students to obtain an educational license to enter residency training, without first completing the Medical Council of Canada Qualifying Examination (MCCQE) Part One.[11]
- In March 2020, the Cura Italia decree changed the rules of Italian medical board examinations, allowing Italian medical students to quickly enter the healthcare system upon graduation, without first completing the postgraduate examination.[16]
- In United States, a "hotspot" state with significant COVID-19 impacts—such as Oregon—moved to allow senior nursing students to work as paid healthcare workers, meeting the demand for care during the pandemic, and serving a clinical experience at the end of their education.[14]

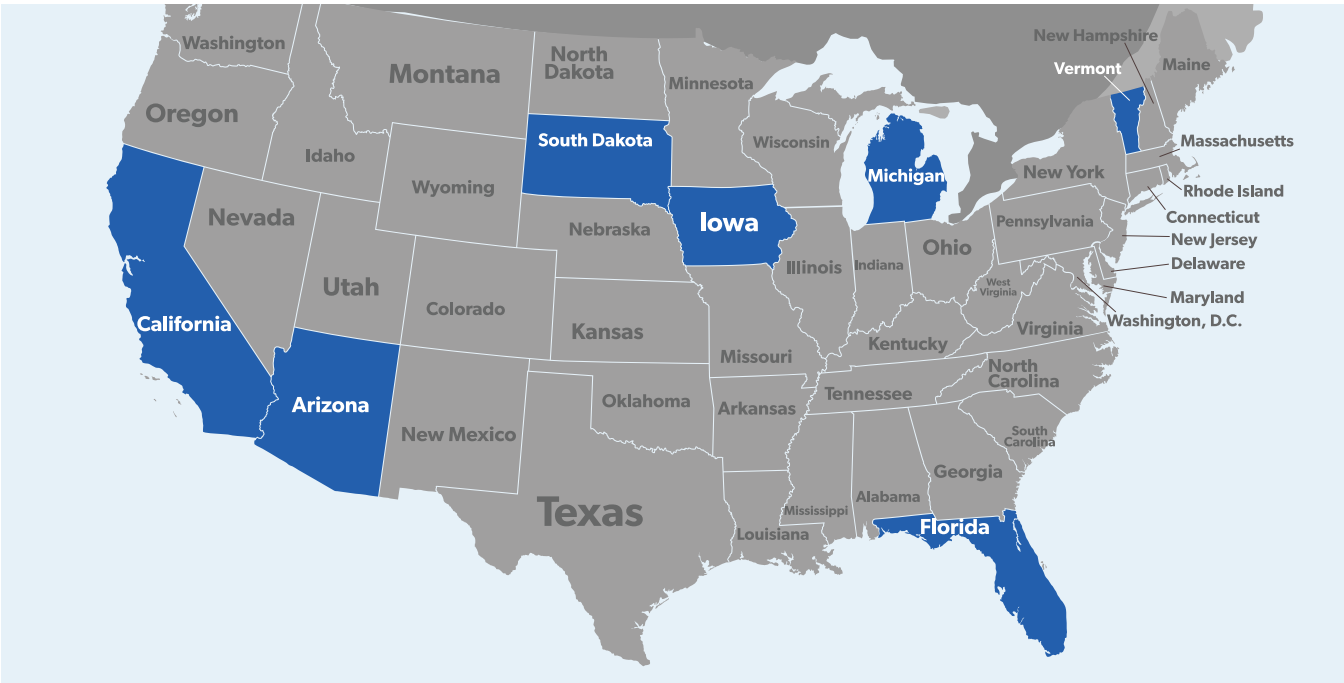
Simulation is commonly used as complementary learning component to direct patient-care experience required for nursing students to graduate. It generally involves people, tools and/or situations that mimic clinical care. High-fidelity patient simulation has proven to have higher effect sizes on clinician knowledge and performance than other teaching methods.[4]
For example, high-fidelity simulation learning has shown to increase test results for French medical students on the National Ranking Examination, when compared to traditional forms of learning.[12]

For the postponed 2020 spring semester, the Ministry of Education in China accelerated the prominence of online and distance education by asking higher education institutions to apply online learning and simulated teaching experiences to deliver education remotely.[22]

During COVID-19, here is a sampling of American states that are making adjustments to

requirements by increasing the number of acceptable hours for clinical simulation:

Arizona	Nursing programs can apply for waivers to substitute online teaching for face-to-face, and replace clinical experiences with simulation[28]
California	Nursing programs can use up to 50% simulation for clinical practice (previous limit on simulation was 25%)[30]
Florida	Nursing programs can substitute supervised remote live videoconferencing for didactic hours and simulation for all supervised clinical instruction hours required[31]
Iowa	Nursing programs can use more than 50% simulation (the previous limit), with a suggestion to acquire more clinical experiences in the future[32]
Michigan	Nursing programs can conduct up to 100% of clinical experience hours using virtual simulation and/or other clinically related online activities[17]
South Dakota	Nursing programs may replace up to 50% of clinical experiences with simulation[21]
Vermont	The 25% simulation cap for nursing programs is temporarily waived[33]



In addition to adjusting clinical guidelines, the National Council of State Boards of Nursing, which develops the National Council Licensure Examination (NCLEX)—a method to test competency of nursing school graduates in the United States—has modified the testing experience through September 2020. Earlier in the year, modified NCLEX procedures were planned into July, but in May, were extended into the fall. Changes include a limited number of testing centers that are open and a new maximum for testing time.[24]

Canadian medical students had increased flexibility in scheduling the MCCQE, as well.[3] For example, in June 2020, the MCCQE Part One was delivered by Prometric via remote proctoring, with the option to test in-person at facilities following physical distancing and other protective measures.[20]

Online and distance education as a new normal

Although the Department of Education had been working on proposed online and distance education regulations for higher education[35] before COVID-19 arrived in the United States, the coronavirus pandemic has essentially required that most colleges and universities offer online and distance education to all students.

In some cases, this transition has provided some unexpected positive side effects. At the University of Sunshine Coast in Queensland (Australia), moving to telehealth models gave students opportunities to develop e-health skills that are essential traits for healthcare workers.[27]

For schools with healthcare programs that require clinical experience, simulation is now taking a more prominent place. There are many benefits to using simulation, including:

- Patient safety and risk-free learning
- Interactivity and engagement for learners—clinical virtual simulation enabled a 20.4% improvement in student knowledge retention and clinical reasoning[26]
- On-demand ability to recreate specific training scenarios repeatedly

Simulation conducted via online and distance education means that facilitators are leading simulations remotely, and learners are training on their own with simulation from home. Virtual simulation means that students are not limited by geography and might get more exposure to practice skills and think independently—versus in-person clinicals, which can sometimes limit actual hands-on exposure.

Common high-fidelity simulation methods used in clinical settings

Standardized patient

- According to the Healthcare Simulation Dictionary–Second Edition, a standardized patient (SP) is, "an individual who is trained to portray a real patient in order to simulate a set of symptoms or problems used for healthcare education, evaluation, and research."[18]
- This type of simulation is often used for practicing therapeutic communication skills.

Virtual or mixed reality

- Virtual reality is, "a computer-generated three-dimensional environment that gives an immersion effect."[18]
- Mixed reality is, "a category that encompasses the hybrid combination of virtual reality environments and reality (e.g., real environment, standardized patient, normal manikin simulator)."[18]
- This type of simulation is often used to develop and maintain clinical skills without physical contact.

Manikin or task trainer

- A manikin is, "a full or partial body simulator that can have varying levels of physiologic function and fidelity."[18]
- A task trainer is, "a model that represents a part or region of the human body such as an arm, or an abdomen. Such devices may use mechanical or electronic interfaces to teach and give feedback on manual skills such as IV insertion, ultrasound scanning, suturing, etc."[18]
- This type of simulation is often used to develop critical thinking, communication and clinical skills.

How schools are responding

> "While these simulations don't provide hands-on learning, students are benefiting by using critical-thinking and decision-making skills, which are essential in a clinical environment. I think there will be a bigger presence for virtual simulations in the future. We have to be prepared for remote options."
>
> Mike Jacobs, DNS, RN, CHSE
>
> *Director & Professor, University of South Alabama Simulation Program*

University of South Alabama

Before COVID-19, the University of South Alabama (USA) Simulation Program included manikin and SP modalities. During the pandemic, the USA Simulation Program transitioned all remaining clinical hours in the term to be done virtually by simulation.

With an already-thriving Simulation Program, this change required USA faculty to re-tool simulation sessions to be conducted as virtually. As a result, students participated in simulations remotely using videoconferencing, while faculty carried out student-directed actions.

Mike Jacobs, DNS, RN, CHSE, Director and Professor at the USA Simulation Program notes that virtual SP sessions have worked well with small groups (no more than four) students. "During a Zoom call, we provide a health history and then conduct a mock patient exam based on instruction from the student. This interaction keeps students engaged—they seem to enjoy it."

Similarly, the USA Simulation Program uses videoconferencing to display information—like vital signs, lab values and medications—from a simulation monitor. Again, working with students to determine actions, faculty does an exam or procedure live in the simulation center, sharing the outcomes with the class. Jacobs says, "It is not quite the same as in-person interactions, however, the virtual solutions are filling the gaps pretty effectively."

University of North Carolina – Chapel Hill

The Clinical Skills and Patient Simulation Center (CSPSC) at the University of North Carolina (UNC) is a place for students from the Schools of Medicine, Pharmacy, Dentistry and Public Health to practice engaging with patients.

While COVID-19 has certainly had an impact on the ability for students, SPs and faculty to be physically together, UNC had been working toward more online and distance education capabilities for simulation for quite some time. With faculty not always on campus—sometimes working at a clinic or hospital—UNC has been working with a simulation system for more than five years that allows faculty to monitor student and SP encounters remotely.

Additionally, in March 2019, UNC conducted a proof of concept option to offer an all-online degree that included working with SPs. In this pilot, SPs visited the CSPSC and interacted with remote students using Zoom.

When COVID-19 arrived, UNC was prepared to fully transition simulation experiences to an online and distance education environment. Jackson Szeto, Clinical Skills Testing Coordinator for the CSPSC notes that having the ability to do more online and distance education has been tremendously helpful. “Many of the SPs that we work with are older—in their 70s and 80s—so, offering an option for SPs to work from home has been huge. We have confirmed that it is possible to effectively do a telemedicine session with everyone remote.”

Keeping pace with online and distance education

As higher education institutions around the world began adjusting to life during COVID-19, simulation centers were closed, and an urgent need to deliver simulation training virtually emerged. CAE Healthcare acted quickly to meet the need for accelerated digitization. For many, the idea of quality and effective clinical education delivered remotely seemed impossible prior to COVID-19. However, within a matter of days of, CAE Healthcare was releasing new curriculum, training, and features that complement online and distance education.

> "CAE Healthcare's strong engineering background enabled us to retool LearningSpace within a matter of weeks for remote delivery of curriculum. Although virtual learning can't replace everything, it's a good direction."
>
> **Gergely Nemeth**
>
> *Managing Director of Operation, CAE Healthcare Hungary*

Products for virtual delivery of simulation training

In addition to high-fidelity patient simulators, CAE Healthcare offers digital platforms and applications that can be used in tandem with these tools—or on their own. Although there is a strong desire from many to have something that immediately works and is credentialed, some degree of customization is always needed. CAE Healthcare is ready to help you customize an online and distance education solution that meets your unique needs.

CAE LearningSpace

Designed as a simulation center management solution, LearningSpace is an online platform that enables virtual delivery of simulation training—including SP encounters, manikin-based sessions and lectures/presentations. Instructor-led and self-directed training and assessments are possible to do remotely because LearningSpace is:

SECURE

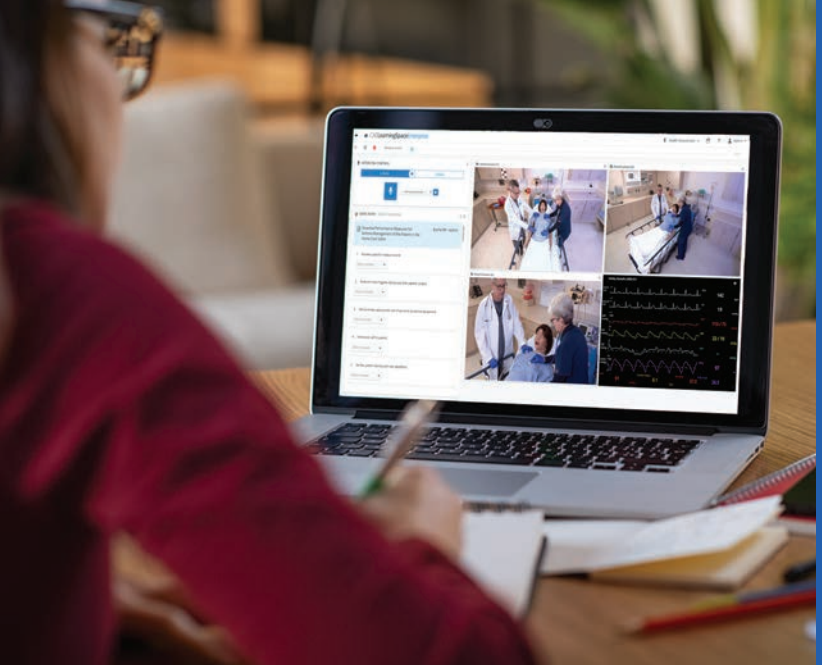
- As a web-based offering, there is no need for separate user licenses and it is accessible from anywhere, on any device, at any time.
- Captured data and recordings are encrypted and backed up regularly.

EASILY INTEGRATED

- Web conferencing software such as Zoom and WebEx make it easy to schedule, record, annotate and assess simulation training. These integrations apply security measures, as well.
- Videos, audio files and documents can be embedded, and accessed remotely by learners.

RELIABLE

- CAE Healthcare consults with your facility to determine simulation center floor plans, designs and camera placements.
- Working with your IT resources, choose to have LearningSpace to run from the cloud, install as a physical system or use a hybrid approach.



> "It used to take 20 hours of prep time to prepare for an 18-student cohor, including scheduling, recording and uploading. With the automation in CAE LearningSpace, that same cohort only needs 30 minutes of prep."
>
> Jackson Szeto
>
> *Clinical Skills Testing Coordinator,*
> *Clinical Skills and Patient Simulation Center*
> *UNC School of Medicine*

There are three tiers of CAE LearningSpace, which include video streaming as a built-in feature to support distance learning:

- **Experience**—A simplified system for intelligent capture and debrief
- **Essentials**—A streamlined system with integrated curriculum and assessment
- **Enterprise**—A comprehensive center management solution that allows for objective structured clinical examination (OSCE) scheduling and SP management

Considering a practical application of using CAE LearningSpace, an OSCE tests skill performance and competence in a clinical setting. Determining how to transition an OSCE from an in-person to an online environment can initially appear like a challenging undertaking.[15] While an OSCE has typically been conducted in a physical room with cameras, an SP and a rotation of clinical learners, LearningSpace Enterprise plus Zoom offers a complete solution to continue education virtually:

- An OSCE can be easily scheduled online
- Students can practice learning exercises on their own—record and upload video, and have it checked by faculty
- SPs and students can communicate on video conference from their homes, and can skip traveling to a simulation center
- Administrators can manage the exam in a virtual room
- Encounters for the exam are recorded and stored

Get more information at caehealthcare.com/learningspace

CAE Maestro Evolve

New this summer, Maestro Evolve is an interactive, highly functional and cloud-based patient simulation platform for online and distance education that runs simulated clinical experiences (SCE). Maestro Evolve offers complete integration with learning management systems. With a familiar interface to users of offerings from the CAE Healthcare suite, Maestro Evolve complements LearningSpace.

Maestro Evolve comes with:

- Virtual Patient and physiological modeling
- Virtual equipment—AED, defibrillator, patient monitor, ventilator
- SCE content library
- 10 GB cloud storage
- Usage reports

As many higher education institutions planning for some degree of physical distancing to continue into the 2020-2021 academic year, this flexible platform enables real-time virtual simulation from anywhere, on any device, at any time. Maestro Evolve is:

HYPER REALISTIC	• Interactive, virtual patients present very real characteristics, conditions and responses that simuluate a variety of health states.
	• Interactive, virtual equipment commonly found in procedure rooms, such as ventilators, anesthesia machines and defibrillators, accompanies virtual patients for a holistic simulation.
SCALABLE	• The platform grows with your facility's needs and is easy to scale based on program growth.
	• A subscription-based model with standardized pricing enables budeting based on needs.
	• As a cloud-based platfom, regular content updates maintain educational relevance.
	• Subscribers have access to free webinars and technical support.
	• Additional custom content can be authored from the CAE Healthcare Academy.
ROBUST	• In addition to craeting your own custom content, Maestro Evolve comes with hundreds of hours of unique SCE content—including content on COVID-19 and ventilators—is physiology and evidence based.
	• With instructor-led training, faculty and staff expertise provides value and engagement similar to in-person instruction.
	• Self-directed training and assessment will be avialable in the future.

While delivering quality simulation via online and distance education is a primary application, Maestro Evolve also maximizes the return on physical simulations. Learners can prepare with virtual simulations ahead of time, to get the most out of an in-person experience when lab space and equipment are in high demand.

Maestro Evolve is a totally unique digital solution that is only available from CAE Healthcare. Get more information at caehealthcare.com/cae-maestro-evolve.

CAE Healthcare Academy

Healthcare students and professionals are often strapped for time—and the convenience of completing or continuing education from anywhere at any time is ideal. CAE Healthcare Academy is launching a new learning management system (LMS) that delivers quality content virtually. Using the LMS affords access to continuing education credits, and hundreds of SCEs, developed in partnership with leading healthcare institutions.

> "Adaptive learning incorporates a wide range of technologies and techniques that observes participants and adjusts the learning experience on demand to meet the unique needs of the participants."
>
> Healthcare Simulation Dictionary–Second Edition

A unique feature of the Healthcare Academy LMS is adaptive learning. Adaptive learning helps ensure learners master concepts by the end of a training session. Through partnership with a global leader in instructional design, content responds to learner needs as a course or training is navigated. As a learner makes a selection or provides an answer, the intelligent LMS software provides pathways to content that will best help the learner achieve full comprehension. The LMS will know which concepts appear to be understood, versus those that could use additional review.

Designed to easily integrate with other CAE Healthcare offerings such as LearningSpace and Maestro Evolve, the LMS makes it easy to:

- Facilitate registration for virtual learning experiences
- Offer online tests for certifications
- Capture training data, and provide a full transcript of all education completed within CAE Healthcare

Launching in late summer 2020 for North America, the LMS has been created by keeping the whole healthcare community in mind, and will eventually include content in several languages that aligns with country-specific licensing guidelines.

Visit caehealthcare.com to understand how the Healthcare Academy LMS can help your students and clinicians successfully achieve educational objectives.

Consulting services for deeper customization

The CAE Healthcare Academy is comprised of experienced clinicians and faculty who are experts in simulation. The CAE Healthcare Academy has developed more than 500 SCEs in partnership with leading healthcare institutions. Together, we can improve the effectiveness and efficiency of your distance learning environment. Work with us to address your unique needs in virtual simulation:

- Design
- Facilitation
- Programming
- Center management

Connect with a representative from the CAE Healthcare Academy at training@caehealthcare.com

On-demand, free education from CAE

Based on the CAE Healthcare Academy's expertise, learn with free webinars on topics that include:

- COVID-19
- Simulation Education
- Distance Learning Options
- CAE LearningSpace
- CAE Maestro

Each webinar is designed to work with a variety of knowledge levels.

Visit caehealthcare.com/education/webinars to register for an upcoming webinar.

CAE Healthcare is your resource for online and distance education in a clinical setting—from expertise on how to create a robust distance training program to the products needed to achieve successful, remote simulation experiences. Sign up for a webinar to learn more.

caehealthcare.com/education/webinars

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For information about CAE Healthcare products in the U.S. & Canada contact your regional sales manager, visit our website caehealthcare.com or call +1 941-377-5562 Toll-free number 866-233-6384

To locate an international distributor in your country visit caehealthcare.com/contact-us

CAE Healthcare offers simulation-based patient, imaging, interventional and learning solutions to improve patient safety and outcomes. Our leading-edge products and learning modules provide risk-free practice and professional development to physicians, nurses, EMS responders, military medics, students and allied health professionals around the world.

Your worldwide training partner of choice

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