Integrating tele-urgent care in undergraduate medical education: a partnership between the US Department of Veterans Affairs and academia

Veronica Sikka[1], Shane Saifman[2], Christian King[3], Suzanne Klinker[4], Theresa Mont[5], Analia Castiglioni[6]

[1]MD, PhD, MHA, MPH, Clinical Contact Center, VA Sunshine Healthcare Network (VISN 8), St. Petersburg, Florida. College of Medicine, University of Central Florida, Orlando, United States
[2]MD, College of Medicine, University of Central Florida, Orlando, United States
[3]PhD, Orlando Veterans Affairs Healthcare System; Center for Decision Support Systems and Informatics, School of Global Health Management and Informatics, University of Central Florida, Orlando, United States
[4]MSM, Clinical Contact Center, VA Sunshine Healthcare Network (VISN 8), St. Petersburg, United States
[5]MSN, RN, Clinical Contact Center, VA Sunshine Healthcare Network (VISN 8), St. Petersburg, United States
[6]MD, Clinical Skills and Simulation Center, College of Medicine, University of Central Florida, Orlando, United States

Abstract

Background: The COVID-19 pandemic made clinical rotations for medical students difficult to maintain in person. Several medical schools adapted to the pandemic by providing some training in telemedicine. The use of telemedicine has grown exponentially in the United States in recent years and COVID-19 acted as an accelerant for its growth. What remains largely unknown is the long-term value and sustainability of telemedicine in medical education. This study aims to address this gap in the literature by examining the value of integrating a clinical virtual urgent care rotation in the training of medical students. **Methods:** The authors examined retrospective descriptive data from Veterans who utilized telemedicine services from a virtual urgent care clinic. The analysis included 2,512 patient episodes with 23 medical students between July 1, 2020 to April 30, 2023. The study examined trends in monthly average first contact resolution (FCR) and tested whether the first contact resolution from the medical student rotation was statistically different from the Clinical Contact Center (CCC) overall. **Results:** The retrospective descriptive analysis found that the monthly first contact resolution for patients seen by medical students was approximately 80%. This average was not statistically different than the 18,000 patient episodes that occurred within the CCC during the same period. Informal feedback from the students was positive, and they all presented on well-received capstone topics such as tele-critical care, tele-cardiology, tele-orthopedics, and a history and critical analysis of telemedicine. **Conclusions:** This study confirmed the value of telemedicine in medical education and the call to medical schools to consider incorporating formal education on telemedicine in the medical student curricula. As medicine moves toward incorporating telemedicine in specialty practices, having it as part of medical education will be a valuable inclusion for future physicians.

Keywords: telemedicine, selective, medical student, residency

Introduction

Telehealth is the use of digital information and communication technologies, such as computers and mobile devices, for patients to access healthcare services remotely. Telemedicine in healthcare existed prior to the COVID-19 pandemic with evolving value for seeing patients.[1] However, the COVID-19 pandemic transformed the landscape of healthcare in response with long-lasting changes. Telemedicine, or virtual care, quickly became the response to continuing medical care while supporting social distancing, improving healthcare access, and using resources efficiently.[1,2] The Centers for Disease Control and

Prevention (CDC) examined trends in the use of telehealth during the emergence of the COVID-19 pandemic from January to March 2020, finding a 154% increase in telehealth visits during the last week of March 2020 compared with the same period in 2019.[3]

The move to include telemedicine in medical education curricula, both preclinical and clinical, was driven by the move to remote learning as well as the surge in telemedicine care and the need to insert students into that clinical setting upon return to in-person sites (most clinics were "seeing" patients virtually). Prior to this pandemic, in-person and hands-on learning were the mainstream modalities for educating future physicians with simulation labs and in-person clinical rotations. The pre-clerkship learning environment in most medical schools consisted of in-person lectures as well as active problem-solving and group discussions. In response to COVID-19, content in the basic sciences, health systems sciences, behavioral sciences and exams transitioned to online platforms.[4] Education delivery and learning methods were adapted to the circumstances faced. According to a survey done in May of 2020 across 39 medical schools in the United Kingdom (UK), there was a significant difference between time spent on online platforms before and during the pandemic. Results showed that 7.35% of students before the pandemic compared to 23.56% of students during the pandemic spent more than 15 hours per week on an online learning platform.[5]

Although not without its challenges, virtual teaching has proven to be an effective tool when implemented properly.[6] Notably different, the clinical learning environment for medical students was traditionally in person with educators and patients. Since the inception of medical education, the medical student has been an active member of an interdisciplinary team. The third and fourth year of medical school is a time when students begin to develop their professional identity, build relationships, and acquire new clinical skills with bedside manners.[7] As COVID-19 infection rates increased, medical schools began removing students from their clerkships, and in March of 2020, the Association of American Medical Colleges (AAMC) suggested that medical students pause their clinical rotations.[4,] Among the first activities to be suspended at the start of the pandemic in teaching hospitals were medical students' clerkships, observerships, and elective opportunities.[8] In response to this sudden change,

medical students' perceptions were mixed. According to a cross-sectional survey sent to students at six medical schools across the United States, most felt that it was appropriate for them to be removed from their clinical rotations given the circumstances.[9]

Medical school education telehealth curricula grew exponentially since the start of the COVID-19 pandemic. The Research Committee of the Alliance of Clinical Education (ACE) surveyed its multidisciplinary group of medical educators regarding telehealth training and education for medical students pre-COVID versus during the COVID pandemic. Results demonstrated that most respondents did not teach formalized telehealth curriculum pre-COVID and provided one to ten hours during the COVID pandemic. Most of this training was done during the clinical years of medical education and was valuable since most respondents noted that 10–30% of student-involved visits during the pandemic were conducted via telehealth.[10]

Despite the limitations of the COVID pandemic, the need for quality clinical training remained to becoming a competent physician. Medical schools across the country created opportunities to offer students meaningful clinical experiences. Some fulfilled fourth year elective requirements via an online format until they could resume previously scheduled third-year clinical rotations.[11] Another academic medical center provided third-year medical students with the opportunity to join inpatient eConsult teams within the medical department.[12] Over an eight-week period, the student consultants wrote notes on 100 patients, saw a range of pathology including COVID-19, and student feedback was largely positive.[12]

Although the COVID-19 pandemic was the impetus for the national move in medical education to tele-modalities, telemedicine is now part of mainstream healthcare delivery, making it imperative that students be prepared to achieve AAMC competencies by graduation.[13] The tele-urgent care rotation established in this study was conceptualized and in the process of development prior to the COVID-19 pandemic. VISN 8 (Veterans Integrated Services Network 8), a region of the largest integrated healthcare system in the country, run by the U.S. Department of Veterans Affairs, covers most of Florida, South Georgia, Puerto Rico, and the U.S. Virgin Islands. Approximately four and a half years ago in 2019, it established a Clinical

Contact Center (CCC) with nearly 10 million calls answered since its inception. The CCC is a 24/7 virtual urgent care organization providing episodic care via telephone and video appointments with physicians and nurse practitioners who work 7 days a week, 24 hours a day, 365 days a year. The CCC provides registered nurse (RN) triage which may result in the scheduling of a provider appointment. The CCC has its own Health Administration Service (HAS) that schedules all video and telephone appointments. The CCC also employs clinical pharmacists and pharmacy technicians who are available to assist with medication questions and prescriptions. This multidisciplinary team of healthcare clinicians and administrative professionals work together to support the CCC mission of enhanced access to virtual care for Veterans.

In addition, Veterans often present with multiple comorbidities given their age and combat history, serving as ideal learning and growth opportunities for students working to better the health of a population that served to protect US freedom. Because of early and more frequent integration of Veterans Affairs (VA) rotations throughout medical school curricula, many graduates are starting and expanding their careers in VA given the multitude of opportunities available.[14] Given these reasons, the patient population and environment are well suited for medical education.

The University of Central Florida (UCF) College of Medicine (COM), located in Orlando, Florida, was established in 2009 with 120 students per class. The UCF COM is considered a partnership university with strong alliances with local hospitals and health systems. The leadership of the CCC decided early in the inception of the virtual urgent care organization that they would like to pursue their commitment to medical education with a selective (fourth year non-required elective) offering to medical students of the UCF COM. They developed a proposal for a tele-urgent care selective and it was accepted by the UCF COM in June 2020. The students in this rotation enrolled themselves into this optional fourth year "selective." This selective met the urgent care/emergency medicine requirement for fourth year medical students. One fourth year medical student is able to participate per each month-long block. The key objectives for this rotation are to understand:

1. The importance of effective and clear communication with the patient, family/caregiver, and other healthcare providers via telemedicine.

2. The importance of putting patients at ease when they feel insecure about using telemedicine technology.
3. How to troubleshoot communication difficulties utilized in telemedicine.
4. The importance of maintaining comprehensive, relative, and timely medical records within Computerized Patient Record System (CPRS).
5. The limitations of tele-urgent care and when to refer for face-to-face care via an emergency department (ED), urgent care (UC), or primary care.

In addition, a comprehensive webpage was developed with all the information for the selective included online. This site includes leadership and attending medical providers' biographies, recorded past student presentations, the syllabus, links to modules on how to conduct virtual physical exams, and suggested resources. As part of the development of this rotation, the leadership created a comprehensive syllabus for students detailing the selective´s goals and process. The syllabus includes important information such as evaluation criteria and course expectations/schedule.

The partnership began immediately with the first fourth year UCF COM medical students enrolled in the selective in July 2020. The students spend a total of four weeks working with physician and nurse practitioner attendings seeing two patients an hour enrolled for care at the Orlando VA Healthcare System. They conduct phone and video visits, based on patient preference, with the attending physicians and patients and conduct the history and virtual physical exam. While they do not chart in CPRS, they develop a narrative history of presenting illness, virtual physical exam findings, and medical decision-making plans for review and feedback by the attendings. The students also spend three half days with nursing, health administration service, and pharmacy staff to understand the operation, close integration, and importance of multidisciplinary teamwork to enhance quality patient outcomes and first contact resolution. The students complete a capstone 30-minute presentation on a telemedicine topic of their choice. This is given to the entire VISN 8 CCC leadership and attendings on the last day of the student's rotation. Challenges associated with the establishment of this rotation include the virtual nature of this selective. Every student needed to have a laptop assigned to them with access to our

Cisco Jabber system, (an application that functions as an all-in-one communication tool).

What remains largely unknown is the long-term value and sustainability of telemedicine in medical education. Although the field of medicine is known for its ability to adapt, it is unknown if these strategies will be permanently adopted in mainstream medical education. A literature review of 388 articles concluded that published evidence in the peer-reviewed literature about clinical telehealth education and training is limited.[15] This study aims to address this gap in the literature. The objectives of this study are to: 1) describe the design and implementation of a Tele-Urgent Care Selective for fourth year medical students; and 2) highlight the value and efficacy of integrating senior medical students into clinical virtual urgent care within the U.S. Department of Veterans Affairs' VISN 8 CCC. The CCC provides one more modality for Veterans to access care, and for future physicians to acquire training.

Methods

This was a descriptive study where data were collected over a three-year study period which included patient age range, gender, COVID-19-related chief complaints (yes/no), and encounter outcome (first contact resolution, ED, UC, primary care referral, no show, or incomplete). The study looked at the trends in monthly average first contact resolution, and tested whether the first contact resolution from the medical student rotation was statistically different from the CCC overall.

The Orlando VA Healthcare System Institutional Review Board determined that this study was exempt from review.

Results

There was a total of 23 medical students in this study. All patients seen by the students over the 18-month period (July 1, 2020 to April 30, 2023) were included for a total of 2,512 patients. Some rotations did not have students rotating because they were preparing for their United States Medical Licensing Examination (USMLE) exams or because of holiday schedules. Table 1 presents descriptive statistics for the patients seen at the CCC. Out of all the patients seen during the study, 80% were men while 20% were women. Over half (53.2%) of the Veterans seen by the medical students were older than 60.

The monthly average first contact resolution (FCR) for the patients seen by the medical students was 84%, ranging from 62%–93%. The month with the lowest percent FCR was during the first month of the rotation in July 2020 with a 62% FCR. The months with the highest percent FCR were during January 2022 and October 2022, with a FCR of 93%. These FCR percentages reflect the proportion of patients who avoided the need for face-to-face care following their CCC encounter, as clinically safe and indicated. Variation in FCR is impacted by patient presentation and clinical acuity and was not related to medical student involvement in the case.

Table 1: Summary statistics of Veterans seen by medical students (n= 2,512)

Gender	Mean / Proportion
Male	79.8%
Female	20.2%
Patient age group	
20-29	4.9%
30-39	12.3%
40-49	11.2%
50-59	18.5%
60-69	26.3%
70-79	21.2%
80-89	4.5%
90+	1.2%

Figure 1: FCR for the patients seen by the medical students during each month of the virtual urgent care rotation. (n=2,512)
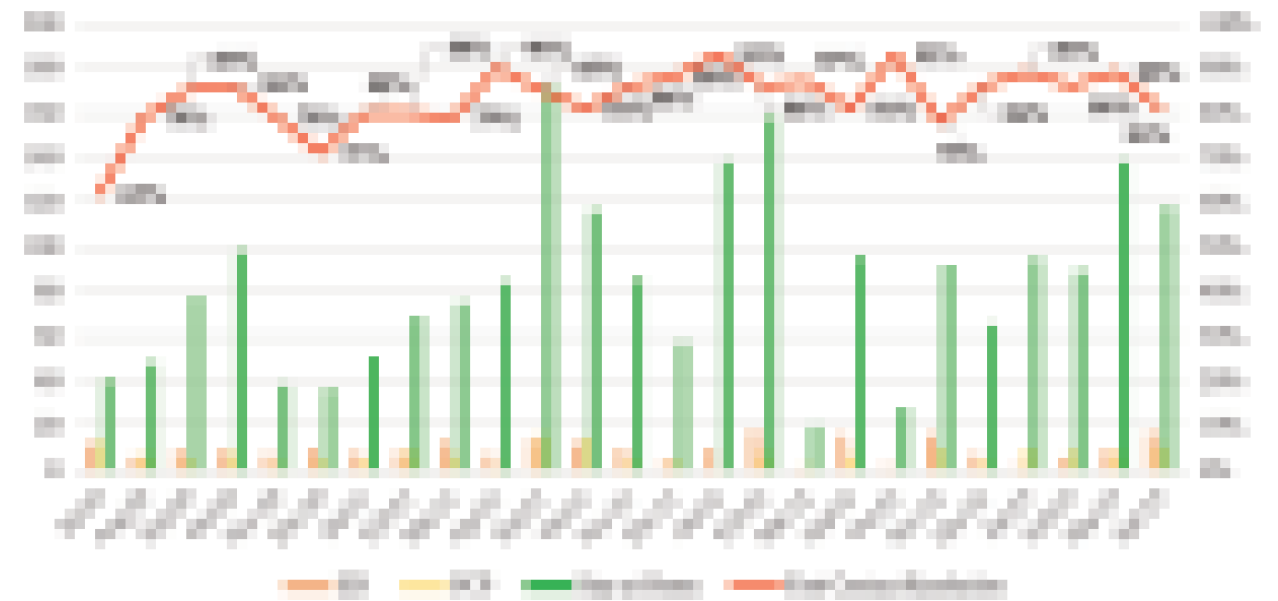
Over this study period, the CCC had 64,929 completed virtual care appointments.

A t-test of difference of means showed no statistically significant difference between the FCR for the CCC overall and the encounters from the medical student rotation.

While there was no formal feedback during this rotation for the first year (July 1, 2020–June 30, 2021), the co-directors of the rotation met with students at the beginning, throughout, and end of the selective. Comments included, "felt very engaged" and "much needed as medicine is changing." Feedback was given to the students from those they shadowed in nursing, health administration, and pharmacy on their experience with each student. Constructive feedback from the students was also incorporated in real time. For example, a student recommended the time spent with nursing, health administration service, and pharmacy be adjusted. This suggestion was taken up and implemented in time for the student starting the selective the following week.

The students all presented on well received capstone topics such as tele-critical care, tele-cardiology, tele-orthopedics, and a history and critical analysis of telemedicine. Their presentations were recorded and uploaded on the medical student webpage for future review and reference.

Discussion

This study confirms the value of integrating telemedicine rotations in the medical education curricula. While the COVID-19 pandemic was an added impetus to engagement in this selective, it is established that telemedicine is now a part of every future physician's medical practice. Integrating rotations such as this into the medical education curriculum will better prepare students as they enter a practice environment that will include some element(s) of telemedicine. Understanding the value and limitations of telemedicine early in training will further potentiate the integration of telemedicine in future healthcare delivery. The CCC was a natural partnership for UCF College of Medicine because of its integrated healthcare delivery model and patient population, but other partnerships can be explored. This study also suggests that perhaps more formal integration of telemedicine modules in the first and second year of medical education curricula may better prepare students for third- and fourth-year rotations.

Limitations of this study include the lack of a formal survey. The UCF COM does not administer a formal survey during the first year of any rotation. During the second year (July 2021–June 2022), the college has been sending students a formal survey assessing their experience in the selective. In addition, there was no formal feedback obtained from the students during the first year of the selective. The co-

directors met with the students to obtain regular feedback, but an objective feedback method was not used for the first 12 months of this study. This also is a descriptive study with no formal regression analysis. Finally, the t-test used in this study compared the main sample size, including the student sample, against the student sample only. It would have been ideal to have excluded this group from the main sample.

Training medical students to deliver high quality, secure, and personalized healthcare through telemedicine will better prepare future physicians to use technologies and critical thinking in the virtual environment to meet the needs of their patients.[16] This study confirmed the value of telemedicine in medical education, and supports the call to medical schools to consider permanently incorporating formal education on telemedicine in the medical student curricula. Telemedicine is now part of mainstream medicine and partnerships such as the one developed between an academic medical center and the largest healthcare system in the United States ensures future physicians are trained early on another method of enhancing access to healthcare for patients.

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