The COVID-19 Catalyst: Analysis of a Tertiary Academic Institution’s Rapid Assimilation of Telemedicine

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Abstract

Introduction: The COVID-19 pandemic forced all urology practices to reconsider the necessity of face-to-face office encounters. Seeking to reduce patient exposure, our urologic oncology office made an immediate transition to telemedicine and this study reports our experience.

Methods: Beginning March 17, 2020 the urologic oncology department committed to see all patients via telemedicine, unless they needed a cystoscopy for high grade urothelial cell carcinoma or recent gross hematuria, or required removal of a Foley catheter or surgical drain. March 17 was assigned day 1, and for the next 14 days rates of face-to-face, audio and audiovisual encounters were recorded. A telephone survey was conducted with all patients who participated in an audiovisual encounter.

Results: In analyzing the numbers of face-to-face, audio and audiovisual encounters, after day 5 more patients participated in audiovisual encounters than any other modality. By day 10 no nonessential face-to-face encounter occurred. There was an 80.4% response rate to our survey. Average patient account setup time was 10.5 minutes and 35.1% required assistance from our office to set up their account, averaging 7.1 minutes. No-show rates of face-to-face encounters were significantly higher than for audiovisual encounters (face-to-face 67%, audiovisual 17%, \( p < 0.001 \)). Overall 82% of patients surveyed were likely to elect for a telemedicine encounter over a face-to-face encounter for a routine visit during future flu seasons.

Conclusions: The current study describes the initial adoption, early clinical experience and patient impressions of rapid implementation of telemedicine during the COVID-19 pandemic.

Key Words: telemedicine; COVID-19; Centers for Medicare and Medicaid Services, U.S; health services accessibility

In December 2019 in Hubei province China a collection of severe cases of pneumonia of unknown cause were identified. On January 7, 2020 the disease was identified as Coronavirus disease of 2019 (COVID-19). The disease spread rapidly within China, then to bordering countries, and on January 23 the United States had its first confirmed case. By March 11,
2020 the World Health Organization had declared COVID-19 a pandemic and that same month, President Trump declared a national state of emergency.1

On March 16, 2020 the urologic oncology department at Charleston Area Medical Center met to discuss their response to COVID-19. CAMC is one of 2 tertiary, academic centers in West Virginia and provides subspecialty urological care to the southern half of the state and bordering states of Kentucky, Virginia and Ohio. The urologic oncology department consists of 2 physicians and a physician assistant. At the time of the meeting, there had been 160,000 global cases of COVID-19 in approximately 150 countries.2 The U.S. had reported 4,226 COVID-19 cases with an acceleration to nearly 500 new cases per day during the previous week.3 On that same day, in response to broader calls to curtail elective surgeries, the ACS (American College of Surgeons) published “Guidance on Triage of Non-Emergent Surgical Procedure.”4 The AUA (American Urological Association) supported ACS recommendations to minimize elective surgeries and had cancelled its annual conference.5 Unknown at the time, West Virginia would report its first case of COVID-19 the following day, March 17.6 Therefore, the CAMC urologic oncology department decided to immediately transition all office appointments, except those deemed necessary, to telemedicine encounters. This study describes the initial adoption, early clinical experience and patient impressions of the rapid implementation of telemedicine during the COVID-19 pandemic.

Materials and Methods

On March 16, 2020 the urologic oncology department at CAMC decided to transition all patients not requiring a face-to-face encounter to telemedicine encounters. Necessary F2F encounters were surveillance office cystoscopies for high grade urothelial cell carcinoma or evaluation of recent gross hematuria, or patients requiring removal of a Foley catheter or surgical drain.

The office schedule from March 17 through March 31, representing the original schedule, was printed and patient age, sex and visit type (new vs established) were recorded. For data collection purposes March 17 was designated “day 1” and each subsequent office day (excluding weekends) for the next 2 weeks was numbered, with March 31 assigned “day 11.” All patients on the original schedule requiring F2F encounters kept their appointments as scheduled. Patients from day 1 and day 2 were asked not to present to the office and were told they would have an audio telemedicine encounter over the phone during their scheduled appointment time. Patients from day 3 through day 11 were contacted and rescheduled to a future F2F encounter or an audiovisual telemedicine encounter. The first AV telemedicine encounter was scheduled for March 20.

The time that office staff spent rescheduling patients was recorded. At the conclusion of the 2-week implementation of telemedicine, a phone survey was conducted for all patients who had participated in an AV encounter (supplementary Appendix A, https://www.urologypracticejournal.com) and another survey was administered to office staff (supplementary Appendix B, https://www.urologypracticejournal.com). Time spent training physicians and office staff on the telemedicine platform was recorded.

Patients scheduled for an AV encounter were sent an e-mail with a link to set up their telemedicine account. They were provided a 3-page instructional PDF document, an instructional YouTube video created by CAMC and the office phone number should they have any additional questions. Patients could also contact the 1-800 help number provided by Teladoc®, the video conferencing platform. Office staff contacted patients on the day of their encounter. If a technical difficulty presented, the time until resolution and need for premature abandonment of the encounter were noted.

All AV telemedicine encounters were conducted using Teladoc. Verbal consent was obtained before all telemedicine encounters and surveys. Our institutional review board approved the project (IRB No. 19-595). All continuous variables were analyzed using ANOVA tests and categorical variables were analyzed using chi-square tests.

Results

A total of 62 work hours were spent on days 0 to 3 rescheduling days 1 to 9. On average, it took 6.9 work hours to reschedule 1 day of clinic. The urologist and scheduler attended 2, 45-minute training sessions on Teladoc for a total of 3 hours of training. No office staff found the introduction of telemedicine very stressful and 66.7% (2) found the experience stressful.

There was an average of 29.1 patients per day on the original schedule. Productivity, as determined by patients per day, decreased between the original and COVID altered schedules. During days 1 to 4 there was no decrease in productivity. Days 5 to 11 were on average 59.6% less productive per day. From the original schedule 16% underwent an A encounter, 9% kept F2F encounter and 75% were rescheduled to AV or future F2F encounter. Age was predictive of patient selection of AV over F2F encounter (59 vs 68 years old, p <0.05), while gender and encounter type (new vs established) were not predictive.
Days 1 to 3 were either an A encounter (77% day 1, 58% day 2, 22% day 3) or a F2F encounter (12% day 1, 18% day 2, 78% day 3). The first AV encounter occurred on day 4 and by day 6 these became the predominant encounter type. Only 1 nonessential F2F encounter occurred after day 8 (fig. 1).

During days 1 to 11 no-show rates of F2F encounters were significantly higher than for AV encounters (67% F2F, 17% AV, p <0.0001). Adjustment of F2F, A and AV encounters for no-show rates indicated day 5 as the transition point from predominantly F2F to predominately AV encounters (fig. 2).

Overall 46 patients participated in an AV encounter. Each participant was contacted up to 3 times in an attempt to complete the survey. The survey response rate was 80.4% and 100% of contacted patients agreed to participate in the survey. Of the patients 100% were able to create an account, requiring an average of 10.5 minutes. Technical difficulty was encountered by 27% and required on average 19.5 minutes to resolve. In the setup process 94.6% used the provided e-mail, 5.4% used the attached YouTube video, 35.1% contacted the office for additional support and 2.7% contacted the Teladoc support line. If office staff assistance was required for resolution of a technical difficulty, it took on average 7.1 minutes to resolve. Of AV encounters 20% were terminated prematurely, all of which were quickly resolved by calling the patient on the phone (3) or transitioning to FaceTime® or Google Hangouts™ (5).

Patient gender, age, visit type, amount of daily social media use or whether they had heard of telemedicine before their AV encounter did not predict technical difficulties during the setup. The locations of the patients during AV encounters, also known as the originating sites, were home (83.8%), work (10.8%) and other public areas (5.4%). Overall 87% of patients denied that there were any aspects of their encounter that were inadequately addressed because of telemedicine.

In addition 84% of patients said they were likely or very likely to elect telemedicine over a F2F encounter for routine visits during future flu seasons and 65% of patients were likely or very likely to have selected a telemedicine encounter before COVID-19. Of those who were likely or very likely to elect for telemedicine for routine visits during future flu seasons, 22.6% were also unlikely or very unlikely to have selected a telemedicine encounter before COVID-19. No variable analyzed, including experiencing technical difficulties during the setup, predicted patient likelihood of selecting a telemedicine encounter during future flu seasons.

Discussion

As expected, given the methods, the rate of A encounters predominated during the first 48 hours. Audio encounters were necessary as the decision to reduce patients’ viral exposure was firm. However, transitioning patients to AV encounters with less than 48 hours’ notice was expecting too much of our patient population, office staff, Information Technology department and attending physicians. Slight postponement of full AV telemedicine adoption was thought to decrease technical difficulties and no-show rates, and increase the chances of patients retaining interest in telemedicine for future encounters.

Before the emergence of COVID-19, CAMC had made several fortuitous steps facilitating our adoption of telemedicine. For years CAMC has offered telemedicine in neurology, cardiology and obstetrics. However, no telemedicine project existed in the urology department and no other department had used telemedicine in the office visit setting. In October 2019 the urologic oncology department was awarded a grant to qualitatively assess the advantages and disadvantages of telemedicine for urological referrals. Software was purchased in December 2019, billing codes were integrated into the electronic medical record and hardware arrived on March 3, 2020 with original plans to “go live” on March 30. Equally serendipitous and in compliance with U.S. Drug Enforcement Administration requirements, CAMC fully transitioned to electronic prescription for controlled substances by the end of January 2020, enabling full prescribing practices during an AV encounter. The work
done before COVID-19 allowed us to more easily offer telemedicine on a HIPAA (Health Insurance Portability and Accountability Act of 1996) compliant platform, seamlessly bill for encounters within our hospital system and offer full pharmacotherapy to patients.

We did not record patient reasons for declining AV encounters when rescheduled to a future F2F or AV visit. However, anecdotally, staff reported lack of Internet access and appropriate hardware (eg smartphone) as the primary reasons for declining a telemedicine encounter. According to the 2018 legislative report from the West Virginia Broadband Enhancement Council, West Virginia is currently ranked 44th among states in percentage of residents without access to broadband Internet services, correlating to 28% of the population without access. Unfortunately, the patients most poised to benefit from telemedicine, the rural and elderly, are those most likely unable to use it.

Under telehealth regulations by the Centers for Medicare and Medicaid Services, patient originating location could not be the home or workplace. However, with the declaration of a public health emergency and subsequent passage of CMS 1135 waivers, telehealth coverage was expanded. According to pre-1135 waiver regulations none of the patients who participated in an AV encounter in our study were at an approved originating location. Upon termination of the declared Public Health Emergency, continued use of telemedicine will require change in CMS policy or relocation of patient encounters to an appropriate originating site.

The initial rescheduling of patients to telemedicine required significant work hours. However, this demand tapered significantly after day 4. Although not quantitatively recorded in this study, as the number of AV encounters increased, in-person office staff demands decreased. Office staff were able to reduce viral exposure by completing more of their tasks at home or reducing working hours.

Compared to the original schedule, productivity, measured as the number of patients seen per day, dramatically decreased with implementation of telemedicine. This is largely due to patients electing delayed F2F encounters over AV encounters at time of rescheduling. We anticipate that as F2F appointment availability becomes unreasonably distant, selection of telemedicine will increase, thereby decreasing the production gap between pre-COVID and post-COVID levels. However, decreased productivity has afforded staff to stay home or be reallocated to other high need areas of the hospital.

Alternative methods of telemedicine implementation were considered, including AV encounters for all patients during their original scheduled time with same day, office staff assisted setup. Ultimately the method presented in this study was selected as it best balanced office staff resources and patient access to the Internet, and was anticipated to minimize patients lost to followup. Additionally, use of common video conferencing platforms such as FaceTime, Google Hangouts, Facebook video chat, Skype or Zoom was considered. In line with AUA considerations and in an effort to establish an enduring telemedicine program we elected to use Teladoc, a HIPAA compliant video conferencing platform.

More than 80% of patients who participated in an AV encounter were likely to elect for telemedicine over a F2F encounter for routine visits during the next flu season. Additionally, 22.6% of patients interested in telemedicine during the flu season indicated it was unlikely that they would have elected for telemedicine prior to COVID-19, implying that decrease in viral exposure, more than other telemedicine benefits such as decreased travel expenses or lost potential earnings, influenced their decision to participate in telemedicine. During the 2018—2019 influenza season there were an estimated 39.5 million cases in the U.S., resulting in 34,000 deaths. The average age of those with an AV visit was 59 years old, and most had multiple comorbidities. Therefore, continued implementation of telemedicine during flu seasons, especially for high risk patients, may stave off sequelae of influenza among our patient population.

There was a significant disparity between F2F and AV encounter no-show rates. During the study news on COVID-19 underwent hourly updates. West Virginia reported its first case of COVID-19 on day 1 of our study and 5 days later state governor Jim Justice conducted a live, statewide address urging residents to stay home. On day 5 he issued an executive order calling for closure of all nonessential business and for residents to stay home, and 6 days later West Virginia reported its first COVID related death. The increasingly dire messages from the governor coupled with an upsurge of reported COVID-19 cases and deaths are thought to have contributed to the elevated no-show rate in F2F encounters.

The majority of nonessential F2F encounters were patients we were unable to contact and, therefore, presented to the office at their scheduled time. Given that these patients had already assumed most of the risks associated with a F2F encounter, they were seen in the office. The rate of nonessential F2F encounters dropped from an average of 3 per day during days 1 to 3 to only 1 nonessential F2F encounter during the last 4 days of the study. We largely attribute this to office staff having more time to contact patients and providing patients with more notice about rescheduling appointments.

Conclusions

Rapid adoption of telemedicine required significant resources during the first 3 days, creating a moderate amount of stress for office staff. Transition from F2F to telemedicine occurred after 5 days. Age was the only measured predictor of which patients
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participated in telemedicine over a F2F encounter. Technical difficulties were minimal and quickly managed. More than 80% of telemedicine participants were interested in future telemedicine encounters and their interest was independent of whether they experienced technical difficulties. Compared to F2F visits, telemedicine patients had significantly fewer no-shows. More than 94% of telemedicine participants were located at home or work during their encounter and more than 86% denied any inadequacies in their telemedicine encounter. Once CMS 1135 waivers are lifted, telemedicine, as offered in this study, will no longer be covered due to inappropriate originating site. To continue to provide this service to patients, CMS policy will need to make long-term adjustments pertaining to originating site requirements.

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Editorial Commentary

Never waste a crisis. Like our neighbors to the west, Inova saw an explosion in virtual visits over a matter of days that would have taken us years to achieve without the burning platform of a global pandemic and social distancing. The authors describe lessons learned from real-world experience and success in quickly transitioning a significant part of their practice to virtual visits. They portray things that worked well, including preparation. Although not specifically mentioned, it appears they had the right mindset to be successful. They describe the real challenges of their patient population as regards limitations on broadband access, and make a call to arms to not put the genie back in the bottle on virtual visits. Experience during the COVID-19 pandemic is a proof of principle on their value to patient care. This work and others’ experience can help shape policy as we move beyond this crisis.

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