Telemedicine in Urology
The Socioeconomic Impact

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KEYWORDS

• Telemedicine • Telehealth • Telesurgery • Urology • Disparities • Socioeconomic

KEY POINTS

- The emergence of the COVID-19 public health emergency has propelled telemedicine into the future by alleviating many of the barriers that telehealth adopters faced.
- The Centers for Medicare & Medicaid Services have made several changes that allow practitioners to continue to utilize telemedicine through a variety of platforms.
- With the adoption of telemedicine came socioeconomic disparities in care and access. It is crucial to ensure equal access to this emerging technology.

INTRODUCTION

In the year 2000, Reed Hastings, the founder and chief executive officer of a new start-up company based on movie rentals by mail, approached Blockbuster, a giant in the movie industry, to merge and lead Blockbuster's online brand. Blockbuster, rigid in its philosophy, refused to adapt with the online revolution and eventually filed for bankruptcy 10 years later. On the other hand, Reed Hastings grew his company to a current valuation of $125 billion and today Netflix leads the digital entertainment industry. This ability to adapt with changing times propelled Netflix into a leadership position in the industry. In many ways, telemedicine has the same trajectory as Netflix. An industry revolution for health care is transforming the ways in which health care is delivered. As usually happens, the adoption of disruptive technology varies greatly, and this may be exacerbated in certain socioeconomic demographics.

Although advocates of telemedicine have been frustrated by the historical lack of action in expanding telehealth services, the emergence of the COVID-19 public health emergency (PHE) virtually overnight has accelerated the adoption of telemedicine several years forward. This article reviews the recent changes in Centers for Medicare & Medicaid Services (CMS) rules regarding telemedicine and postulates its future impact; additionally, it focuses on the socioeconomic impact of telemedicine adoption on urology patients.

BACKGROUND

Urologists will need to deliver telemedical care strategically in a scalable fashion that does not further the socioeconomic gap that already exists in health care. *Telemedicine* and *telehealth* are terms that describe the interactive exchange of health care information electronically between patients, providers, and consultants for the purpose of education, evaluation, decision making, and treatment. These interactions include text, audio, video, and audio-video communication. This may be live (synchronous) or as store-and-forward (asynchronous) interactions. Platforms are increasing and include personal computers, pads, tablets, smartphones, watches, wireless wearable sensors, and other emerging technologies. Under the official pronouncement by the federal government declaring COVID-19 a PHE,

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waivers were issued that eased many telemedicine restrictions in a matter of weeks that had challenged the progress of telemedicine for years in the pre–COVID-19 era. Limitations on in-person visits due to safety concerns coupled with this liberalization of telemedicine requirements fast-tracked physicians across most specialties to integrate telemedicine into their practices. The early adoption of telemedicine by a minority of urologists helped onboard the vast majority of the nation's remaining urologists.

WORKFORCE SHORTAGE

Telemedicine may provide a high-value solution for the workforce and access shortages in urology that have a disproportionate impact on communities from lower socioeconomic strata. The urology workforce will continue to be stressed with a progressive imbalance in available urologists to patients. It is estimated that by 2030, 20% of the population will be age 65 or older with increasing surgical needs. By 2030, urology will face a 32% (3884 urologists) shortage for greater than 350 million US citizens. According to the 2018 American Urological Association (AUA) census data, 30% of urologists are greater than 65 years old, a clear concerning sign of a progressive urologist shortage.[1] Urology is the second oldest specialty after thoracic surgery, confronting the profession with the prospect of losing a quarter of its workforce in a short period of time.[1,2]

Telemedicine can improve workforce efficiency and provide competitive advantages. Telemedicine can allow urologists to care for patients in larger geographic areas, addressing the scarcity of urologists in rural areas; 62.2% of US counties have 0 urologists, limiting patient access to necessary care. Even large urology groups may be challenged to meet the demands of their contracted population in urban and suburban markets but may use telemedicine to meet these challenges. Well after the COVID-19 PHE, telemedicine can allow urologists to leverage their subspecialty expertise across a larger population, allowing them to reach patients in need of their services whom they otherwise would not be able to encounter in person. Additionally, groups that adopt telemedicine for their patients' convenience will meet rising patient expectations for telemedical access, because many patients will have been introduced to telemedicine during the PHE who otherwise would not have. Traditional sectors of society already have incorporated and transformed a customer-centric focus, including travel, retail sales, and banking. Medicine will as well.

PRE-COVID-19 TELEHEALTH COVERAGE

Prior to the PHE, health care reform, with its emphasis on value, was bringing more attention to the prospect of telemedicine. In many states, private payers were mandated to cover telemedicine services, often on par with office encounters. Medicaid covered telemedicine in almost all states. The Department of Veterans Affairs (VA) had been a true trailblazer in the world of telehealth. In 2019, the VA reported more than 900,000 veterans utilized its telehealth services (235% jump from previous year). Furthermore, the VA announced a 17% increase in televisits, delivering greater than 2.6 million telehealth episodes in 2019.[3]

Medicare had been very restrictive prior to the PHE, limiting coverage to remote geographies or certain chronic care scenarios but allowing some liberalization through alternative payment models, such as alternative care organizations or bundled payments. At the start of 2020, traditional Medicare and Medicare Advantage plans expanded telehealth coverage, limiting restrictions on patient location requirements and expanding coverage for more diagnosis.[4] As of March 1, 2020, during the PHE, traditional Medicare has radically liberalized access to telemedicine across effectively all locations and all conditions. The extent to which this will remain after the PHE has concluded is unknown, but even with a significant retraction, urologists can be well positioned to participate in alternative payment models that would compensate for telemedical services.

TYPES OF TELEMEDICAL SERVICES

Video Visits

A video visit is a live face-to-face electronic audio-video interaction between a provider and patient. Prior to the PHE, the combination of both audio and video was required by almost all payers for reimbursement. Telephone encounters are reimbursed by Medicare during the PHE but the extent to which that will remain is uncertain. Other payers may or may not provide reimbursement for telephone calls. In spite of the limitations of an on-screen encounter, video visits are successfully providing alternatives to traditional visits in a variety of settings, including clinic, office, urgent care, hospital, and skilled nursing facilities.

Online Digital Evaluation Services

Patients may access portions of their electronic medical record and communicate with their urology care team. Value-added services also include online appointment scheduling, form submission

such as history intake questionnaires, and online bill payment. Additionally, a practice can provide patient alerts for preventative services as well as definitions of conditions and guidelines and reminders for care, such as urology cancer rechecks. These services typically were not billable but they brought value to patients and helped satisfy government mandated meaningful use criteria for electronic health records.[5] During the PHE, traditional Medicare is reimbursing certain components of these services, known as virtual check-ins and digital evaluation services, whereby patients may communicate with their providers via text, e-mail, or chart portals, to determine the need for an in office visit or to efficiently address concerns not requiring an imminent office visit.

eConsults

eConsults allow a urologist to asynchronously answer another provider's focused questions about the diagnosis or management of a specific patient. The urologist reviews the supporting material from the electronic medical record and provides a formal response to the focused question. Consultations most likely are solicited from large academic centers but also can be solicited from large urology groups. eConsults also can be synchronous (involving real-time interactions similar to video visits) and in this context also are known as video consults. In contrast to video visits, a patient typically is not present during a video consult. eConsults are performed using electronic software and hardware specifically for electronic consultations. For example, a portal called WebSphere (Cisco, San Jose, CA) has been used for eConsults. The response is documented in the medical record of the provider completing the eConsult.

eConsults are convenient for requesting providers and patients alike because they provide timely access to specialty expertise without requiring the patient to actually travel to visit with another urologist. Thus, eConsults allow patient visits to be completed in a shorter time frame and streamline the delivery of care. Scheduling also is more flexible with eConsults, especially asynchronous consults that can be completed outside of regular business hours. By using asynchronous eConsults particularly for more straightforward urologic problems, it is anticipated that more time would be spared for synchronous eConsults or traditional face-to-face consults on more complex patients during regular business hours. The concepts used in synchronous eConsults also have been applied to virtual tumor boards. Studies assessing the benefit of eConsults uniformly have demonstrated a reduction in the number of required in-person consults, ranging from 62% to 92%, optimizing patient time and physician efficiency.[6] With virtual tumor boards, detailed case presentations are made in the same way as traditional tumor boards. Radiologic studies and histologic findings are reviewed ahead of time with a radiologist and pathologist, respectively. Using this approach, a second opinion for the patient is obtained and the mechanism is a powerful means to keep high standards of clinical care and performance within the control of a private large group practice.

Tele-intraoperative Consultation

Although adoption is still in its infancy, the intraoperative consultation is perhaps the most innovative and valuable application of telemedicine. The urologist offers electronic consultations regarding intraoperative findings with other surgeons remotely. Tele-intraoperative consultations promise to enhance productivity and surgical quality as this matures. Hung and colleagues[7] categorized currently available telesurgical technologies into 4 categories: verbal guidance, telestration, guidance with teleassist, and telesurgery. Verbal guidance is simply a 2-way communication between surgeon and consultant with video monitoring, the benefit being it is easily implemented with low cost and minimal bandwidth requirements. Telestration allows a consultant or mentor to telestrate in 2-dimensions or 3-dimensions, aiding the surgeon through various aspects of a procedure. TIMS Consultant (TIMS Medical, Chelmsford, Massachusetts), an interactive video broadcast network within hospitals, such as Kaiser Permanente, provides high-resolution, live video streams anywhere remotely, including compliant smartphones and laptop computers. Remote multiparty interactivity and collaboration are provided through integrated audio conferencing and live telestrations. Teleassists allow for the mentor or consultant to reach into the patient remotely and physically aid in a procedure. Lastly, telesurgery allows for the entire surgery to be completed remotely.[7] Sterbis and colleagues[8] performed 4 porcine radical nephrectomies utilizing the daVinci robot (Intuitive Surgical: Sunnyvale, CA) from greater than 1300 miles away.

Telementoring and Teleproctoring

A urologist can serve as a mentor and/or proctor during a telesurgical procedure creating telementoring and teleproctoring services.[9–12] This has broad implications with licensure and credentialing in the practice of urology. Telementoring and

teleproctoring can address cumbersome and impractical barriers posed by physical proctoring. Hinat and colleagues,[13] in 1 of the first reported series of telementoring and teleproctoring in robotics, used a telementoring system to promote surgical techniques associated with robotic-assisted radical prostatectomies. The group demonstrated proper function and acceptable latency with no differences in surgical outcomes, incline operative times, complication rates, early continence status, and positive margin rates between the telementoring and direct mentoring groups.

Telesimulation and Telesurgical Rehearsal

Simulators now are being used to teach minimally invasive surgical techniques. A network of simulators can assist teaching and evaluating novice surgeons and those who desire improvement. Simulators can standardize teaching and as well allow for interactive proctoring during the simulated procedures. A surgical dress rehearsal may be possible before the actual operation. Currently, urology patient–specific simulations are in development that could be integrated into established training programs rapidly and easily.

Telemedicine: Systems and Procedures

As with traditional care delivery, telemedicine can be enhanced by following standard operating procedures. General and specialty medical societies currently are generating guidelines for telemedicine that include technical instructions and ethical considerations. Guidelines also increase the delivery of high-quality and safe patient care, key themes needed for telemedicine to be supported by legislators and payers.

Prior to the PHE, telemedicine was required to be delivered using secure Internet-based videoconferencing technologies. During the PHE, encrypted platforms still are encouraged but not required by Medicare when their unavailability creates a barrier to access. Non–Health Insurance Portability and Accountability Act (HIPAA) compliant platforms, such as FaceTime, are allowable but public facing platforms, such as Facebook Live, are not. Furthermore, during the PHE, telephone encounters may be conducted for reimbursement on par with video encounters. Nonetheless, after the PHE, telephone-only encounters may or may not continue to be reimbursed and HIPAA requirements for secure connections likely will return. It is advisable to select a secure video platform for a long-term telemedical strategy. The network used for telemedicine typically is a secure virtual private network, with software that typically is licensed to a host institution. Videoconferencing with encryption software can be downloaded to connect with patients directly in their own homes or other noninstitutional settings. Internet-based platforms also can be used as an alternative portal for urologists and patients seeking telemedicine services. Telemedical encounters also may be initiated by patients via direct-to-consumer telemedical companies, such as Hims and Roman, which specialize in select male health concerns.

For practices considering implementation of video visits, it is useful to consider the urologic diagnoses for which video visits will be most effective. The experience with many urologists during the PHE is that most, if not all, diagnoses can be managed in part or in whole with telemedicine. Telemedicine need not be an either/or proposition, such that a visit that is conducted telemedically does not preclude a prompt follow-up in-person visit when deemed necessary.

Informed consent is established prior to the start of the video visit. The consent typically is conducted in real time following laws within a patient's jurisdiction. The provider should document the consent in the medical record. The consent should include a discussion about the structure and timing of services, record keeping, scheduling, privacy, risks, confidentiality, mandatory reporting, and billing. Confidentiality and the limits of confidentiality in electronic communication also should be discussed. It also is important that the issue of video recordings be discussed. Specifics regarding technical failure of the video visit, protocols for contact between sessions, and conditions upon which the video visits will be terminated in lieu of a traditional visit also need to be established.

Video visits need to be carried out in an appropriate environment for both the provider and the patient to maximize privacy. Video cameras and lighting should be optimized for both the patient and provider during a video visit. If a patient attempts to carry out a video visit in a public space, the provider should recommend that the consultation be delayed until a suitable private space is identified. The consultation should start with identity verification of both the provider and patient. In many instances, a host clinic may perform the verification prior to starting the video visit. The location of the provider and the patient also should be established during the video visit. Contact information for both the provider and the patient should be verified during the video visit. Lastly, the expectations regarding the video visit and any subsequent visits should be discussed.

The urologist must make an entry in the medical record in a fashion similar to that for traditional visits once the video visit is complete. The medical record entry should include an assessment and plan, patient information, contact information, history, informed consent, and information regarding fees and billing. As part of the documentation, it also is important to note that the patient was seen using telemedicine technologies.

Regarding connectivity, audio-video telemedicine services can be provided through personal computers or mobile devices that use Internet-based videoconferencing software programs. A bandwidth of 384 kilobits per second or higher in both the downlink and uplink directions is recommended.[2] Because different technologies provide different video quality results at the same bandwidth, each endpoint should use a bandwidth sufficient to achieve at least a minimum of 640 pixels $\times$ 360 pixels resolution at 30 frames per second. Each party should use the most reliable connection to the Internet during the video visit.

Next, it is important to verify the patient has the required hardware and software capabilities for a video visit and sufficient broadband connectivity. The patient should be provided contact information for technical support in case troubleshooting is required. Rather than have the patient manage the requirements of the video visit, another option is for the patient to report to a telemedicine center where the hardware, software, and connectivity are provided and standardized for maximum reliability.

The increasing availability of 5G networks throughout the country will have a significant impact on telehealth availability as adequate information technology infrastructure will be available to remote patients and clinicians; 5G wireless ecosystems will continue to grow, given both regional and national initiatives from network and wireless providers. Compared with 4G, 5G can be expected to be 100-times faster, with 25-times lower lag times and 1 million devices supported in 1 square mile. The 5G systems will allow for reliable, faster connections, resulting in high-quality video connections and data transfer.[14]

Efforts should be taken to make audio and video transmission secure by using point-to-point encryption that meets recognized standards. Currently, Federal Information Processing Standard Publication 140-2, is the US Government security standard used to accredit software encryption and lists encryption types, such as advanced encryption standard, as providing acceptable levels of security. When patients or providers use a mobile device, special attention should be paid to the relative privacy of information being communicated over such technology. Mobile devices should require a passcode and should be configured to have an inactivity timeout function not exceeding 15 minutes.

GAPS TO ACCESS

With the emergence of telemedicine in urology came socioeconomic inequalities in care. Many patients do not possess the basic technology required for a robust telehealth visit. In the initial PHE rules, telephone encounters were not included creating an access gap for those who did not have adequate Internet, smartphones, or computers. On March 31, 2020, CMS allowed for telephone services to be covered during the PHE (Current Procedural Terminology code 99441-99443), including creating parity between telephone and televideo visits. This bridged a significant access gap for those unable to perform video visits.

Prior to the PHE, coverage and reimbursement for telephone calls were severely limited. G2021 Healthcare Common Procedure Coding System (HCPCS) code (brief communication technology-based service) seldom was used and had limited reimbursement. Although telephone coverage expanded access, investigators are assessing its adequacy as a telemedical platform. The utilization of telephone calls was studied by Safir and colleagues,[15] who compared telephone with face-to-face encounters for hematuria consults in the VA population. They found access improved from 72 days to 12 days, although overall satisfaction with visit was higher in the face-to-face visit cohort (92% VS 84%).

The launch of telemedicine in the Bronx, New York during the PHE offers a glimpse into its utilization and limits in a socioeconomically disadvantaged population. Montefiore Medical Center, one of the largest and diverse hospital systems in the country, transitioned almost overnight to 95% telehealth visits. This was in a population where approximately 50% of households did not have adequate Internet access, 20% preferred non-English language, 44% relied on Medicaid, and 40% lived in poverty. The group found 88% satisfaction with video visits and 81% for telephone-only encounters; 67% of patients felt they received similar care as in office visit whereas 79% would choose a telemedicine encounter. Similar to previous research, clear travel time and clinic wait time advantages were seen for telehealth. Lastly, there was a preference for phone visits compared with video visits, a majority citing technologic limitations as the reason telephone is preferred.[16] This

small study highlights the need for continued expansion of telephone-only encounters.

Although CMS has recognized telephone services as telehealth by adding them to Medicare telehealth services, the degree of coverage beyond the PHE has yet to be seen. CMS understood the importance of this technology because it allowed for social distancing and expanded access for underserved populations. As the new 2021 CMS rule currently stands, telephone-only encounters will not continue after the PHE. CMS, however, did introduce G2252 HCPCS code, which is a virtual check-in for established patients with incremental times to account for differing time spent on the phone. This will lead to a significant cut in relative value unit per time spent with patients on phone. In addition, this cannot lead to an in-person visit within 7 days and may not result from a recent visit.

NEW 2021 CENTERS FOR MEDICARE & MEDICAID SERVICES RULES

Several changes in the 2021 CMS rules will have a long-lasting impact on providers and patients utilizing telemedicine. The most significant change in the 2021 rules is the emphasis on medical decision making (MDM) when determining levels of service. No longer are particular history and physical examination components required; rather, providers determine level of service on MDM alone. The history and examination are left to the discretion of the provider to perform what is medically appropriate. By eliminating the physical examination requirements, providers can focus on MDM and be reimbursed for their work based on the complexity of the patient. This is important especially when utilizing telemedicine because the ability to perform a comprehensive physical examination is limited. By way of example, a new patient with metastatic prostate cancer with multiple complicating factors can be billed at the same level as an in-person encounter because CMS no longer requires the detailed physical examination previously required. Furthermore, for time-based billing, the total time now includes previsit and postvisit preparation and coordination. For many providers, this better represents the amount of time it takes to care of patients. Although the telehealth visit itself may take only 10 minutes, CMS now reimburses for time spent reviewing imaging, records, and coordinating care at the conclusion of the visit.

Evaluation and Management Changes

During the PHE, the list of covered telehealth services was expanded significantly. Some of these are set to expire after the PHE whereas others were added to the permanent covered services. A list of services covered through 2021 is in Table 1.

Table 1
Current procedural terminology codes for services covered through 2021

Rest home visits	99336-99337
Home visits	99349-99350
Therapy services	97161-97168, 97110, 97112, 97116, 97535, 97750, 97755, 97760, 97761, 92521-92524, 92507
Critical care codes	99469, 99472, 99476, 99478-99480, 99291-99292
Discharge codes	99315-99316, 99238-99239,
Observation management	99217, 99224-99226
Emergency department	99281-99285

For the time being, many of the restrictions associated with originating sites will revert back to pre-PHE rules when the PHE expires. This means that services covered on the PHE list, including evaluation and management codes, will be restricted to those in rural areas (health shortage regions) and at approved facilities. Legislation surrounding the originating site is expected to change because there is a strong push to permanently eliminate originating site restrictions. One area of particular interest is the status of remote patient monitoring and its reimbursement. This has the potential to expand the diagnostic reach to patients in more rural areas of the country bridging significant geographic disparities in care. The final rule states that remote patient monitoring can be used for established patients but must be a Food and Drug Administration–approved device with certain data collection requirements.

Advanced Practice Providers

The role for advanced practice providers (APPs) has expanded exponentially over the past decade. There is a projected shortage of physicians, ranging from 46,000 to 121,000 by 2032. Urology is likely to be plagued greatly by this shortage given it is the second oldest surgical specialty, with more than 18% of its workforce greater than 65 years old.[2] Although increasing the role of APPs potentially can address this workforce

shortage, adequate supervision is imperative. Technology-based supervision has the potential to expand access with an increasing APP workforce while simultaneously providing adequate and efficient supervision. During the PHE, CMS has allowed for supervision of APPs utilizing audio and visual technology. There are new CMS rules surrounding direct supervision of APPs. Direct supervision traditionally meant that a physician must be in the same office and immediately available to assist. During the PHE, direct supervision is able to be accomplished through combined audio-video communication. Audio alone does not satisfy the requirement. This allows APPs to perform procedures and see patients without the overseeing doctor being physically in the office. This has been extended until December 31, 2021, or the end of the PHE, whichever is later.

DISPARITY IN TELEMEDICINE CARE

With the accelerated rise in telehealth adoption, many healthcare professionals are concerned that this has resulted in an unequal distribution of health care resources, further widening racial and socioeconomic disparities. At its inception, telemedicine was meant to expand the health care reach to underserved populations and those living in rural areas. With telehealth companies focusing on well-resourced patients in order to expand their market presence, the concern is that those for whom telehealth initially was intended will be left behind. Furthermore, relying on telehealth algorithms for care risks magnifying disparities because underrepresented populations often are not included in algorithmic data. Few studies have assessed the socioeconomic impact of the rapid changes in telehealth that have occurred under the PHE. Weber and colleagues,[17] a group from one of the largest health care systems in New York City, evaluated telehealth utilization for COVID-19-related care at the height of the initial COVID-19 wave. They found that compared with whites, blacks and Hispanics were more likely to go in person to emergency rooms and in-office visits rather than utilizing telehealth services. Similarly, patients greater than 65 years old utilized in-person emergency room and office visits at higher rates than their younger cohort. Similarly, Eberly and colleagues[18] reviewed records of 150,000 patients who scheduled telemedicine visits at the beginning of the pandemic (March 2020–May 2020). They found that 54% of patients followed through with their visit. Furthermore, they found disparities in utilization for age, race, and income. They found that when comparing utilization of video visits versus telephone encounters there was a lower video utilization in women, blacks, Hispanics, and low-income families.[17,18] Some reasons for this inequality include technology barriers for older patients, language barriers, Internet constraints in lower-income patients, and lack of adaptations for those with disabilities (ie, visually and hearing impaired). Because there may be benefits unique to video visits as providers are able to examine patients visually and pick up on various visual cues, it is important for physicians, hospitals, politicians, and insurers to ensure equal representation in all telehealth services.

CONTEMPORARY (PUBLIC HEALTH EMERGENCY) UTILIZATION

The emergence of COVID-19 and the subsequent PHE propelled telemedicine into the future. Urologists were quick to adopt telemedicine to facilitate social distancing, continue care for their patients, and keep practices financially viable. Urology saw a dramatic acceleration of utilization, with 71.5% of urologists stating they participated in telemedicine during the PHE according to the 2020 AUA annual census data. The most common telemedicine topics were benign prostatic hyperplasia, elevated prostate-specific antigen, erectile dysfunction, stone disease, and voiding dysfunction. Approximately half of urologists provided telemedicine encounters for new patients and 77% provided encounters for established patients. According to census data, of those urologists participating in telemedicine, urologists receive compensation primarily for video visits (93.9%) and telephone calls (77%) whereas fewer than 11% reported receiving compensation for eConsults, video visits with other providers, and text messages.

SUMMARY

Just as Reed Hastings adapted to the changing landscape of movie rentals, so has the field of urology adapted with the rapid emergence of telehealth. Telemedicine appears positioned to be a mainstay of health care systems beyond the PHE and urologists are well positioned to pioneer the expansion of services. In addition to meeting the current demands for social distancing arising from the pandemic, telemedicine specifically may help address the needs of underserved communities by addressing workforce shortages. It also will prove instrumental to increasing clinical and surgical productivity, improving patient access to care, and facilitating data quality reporting. It is crucial to focus on those who benefit most from this new technology (ie, underserved populations)

and ensure equal access. As the initial limitations have been radically removed and as new solutions are developed both in the technology and regulatory sides, it is possible that telemedicine will become completely integrated into urologic training and health care delivery to fulfill its promise of access and quality urologic care.

DISCLOSURE

The authors have nothing to disclose.

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