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Disparities in Telemedicine Utilization for Urology Patients During the COVID-19 Pandemic



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OBJECTIVE	To determine the odds of accessing telemedicine either by phone or by video during the COVID-19 pandemic.
METHODS	We performed a retrospective study of patients who were seen at a single academic institution for a urologic condition between March 15, 2020 and September 30, 2020. The primary outcome was to determine characteristics associated with participating in a telemedicine appointment (video or telephone) using logistic regression multivariable analysis. We used a backward model selection and variables that were least significant were removed. We adjusted for reason for visit, patient characteristics such as age, sex, ethnicity, race, reason for visit, preferred language, and insurance. Variables that were not significant that were removed from our final model included median income estimated by zip code, clinic location, provider age, provider sex, and provider training.
RESULTS	We reviewed 4234 visits: 1567 (37%) were telemedicine in the form of video 1402 (33.1%) or telephone 164 (3.8%). The cohort consisted of 2516 patients, Non-Hispanic White (n = 1789, 71.1%) and Hispanic (n = 417, 16.6%). We performed multivariable logistic regression analysis and demonstrated that patients who were Hispanic, older, or had Medicaid insurance were significantly less likely to access telemedicine during the pandemic. We did not identify differences in telemedicine utilization when stratifying providers by their age, sex, or training type (physician or advanced practice provider).
CONCLUSION	We conclude that there are differences in the use of telemedicine and that this difference may compound existing disparities in care. Additionally, we identified that these differences were not associated with provider attributes. Further study is needed to overcome barriers in access to telemedicine. UROLOGY 163: 76–80, 2022. © 2021 Elsevier Inc.

The novel coronavirus, COVID-19, is causing significant disruption in healthcare delivery throughout the United States with accelerated adoption of telemedicine platforms to deliver ambulatory care. Many urologic practices are shifting resources to deliver urologic care in the form of telemedicine.¹ Further, some authors have suggested that telemedicine might be used to reach underserved and rural populations who might lack urologic care.^{2,3} Ultimately, little is known about how urologic practices have adopted this technology and the characteristics of the patients engaging in telemedicine visits. Current analyses on this subject are limited to small studies prior to the pandemic or small surveys of patients

about their preferences.⁴ Secondly, little is known about the association of provider bias on telemedicine utilization.

We sought to determine differences in telemedicine usage at an academic urologic practice which serves a diverse regional population during the initial phase of the COVID-19 pandemic. Due to the rapid adoption of telemedicine some populations might be disproportionately lack access to telemedicine further impacting care. We hypothesized that there might be disparities in the adoption of telemedicine depending on patient characteristics.

METHODS

We retrospectively identified patients older than 18 years old who were seen for a urologic condition between March 15, 2020 and September 30, 2020 at a single institution. Our institution, UC San Diego Health, is a large academic institution serving the County of San Diego. We have two hospitals that are within close proximity to each other. Patients were seen within

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hospital-based clinics at these two sites by a cumulative sum of 23 providers.

Patients were excluded if they participated in a procedure visit (ie, cystoscopy or prostate biopsy). All patients were offered a telemedicine (video or telephone) visit and providers were asked to review whether this was appropriate prior to scheduling. Prior to March 15, 2020 telemedicine was not available to providers or patients in the clinic setting at our institution. The clinic work flow is further detailed in [Figure 1](#).

We grouped ICD-10 codes to identify the reason for visit into the following categories, general urology/endourology, reconstructive, infertility, oncology, and female urology. Our primary outcome was to determine patient characteristics associated with the use of telemedicine services either by phone or video using multivariable logistic regression analysis. We performed a step-wise backward model selection. Variables that were the least significant were removed. Variables that were not significant that were removed included median income estimated by zip code, clinic location, provider age, provider sex, and provider training. The final model adjusted for patient characteristics such as age, sex, ethnicity, race, reason for visit, preferred language, and insurance.

We evaluated provider characteristics to determine if there was variation in provider usage of telemedicine. We used Chi-squared distribution to evaluate telemedicine usage by provider age, sex, and training (Advanced Practice Provider or Physician). We did not have access to provider race/ethnicity. We also performed a sensitivity analysis excluding providers with less than 30 patients seen within the time period. We performed a secondary sensitivity analysis removing billing codes to identify outlier visits that may necessitate in-person follow up. This was determined by identifying that certain billing codes (ie, testicular mass) were more likely to result with in-person follow up.

Statistical analysis was performed using SPSS v.27 (IBM, Armonk, NY). *P*-value <.05 was considered to be significant. This study was approved by our Institutional Review Board, IRB #200724.

RESULTS

Over a period of 6.5 months, we analyzed a total of 4234 visits from 2516 patients over the study period; 1567 (37%) were telemedicine in the form of video 1402 (33.1%) or telephone 164 (3.8%) ([Table 1](#)). There were a total of 2516 unique patients included. Our cohort was notable for a large proportion of patients older than 65 years old (*n* = 1653, 65.7%), male (*n* = 2092, 83.1%), White race (*n* = 1789, 71.1%), English speaking (*n* = 2242, 89.1%), with commercial insurance

(*n* = 1264, 50.2%) or Medicare (*n* = 1,1559 46.1%). Our sample size is notable for an ethnically diverse patient population including 417 (16.6%) Hispanic patients. A majority of visits were for general urology/endourology (*n* = 2300, 54.6%).

In multivariable analysis ([Table 2](#)), patients were less likely to access telemedicine if they were older (reference age <55 years), ≥75 [Odds Ratio (OR) 0.69, 95% Confidence Interval (CI) 0.54-0.88, *P* = .003], 65-74 (OR 0.80, 95% CI 0.64-0.98, *P* = .049) and 55-64 (OR 0.79, 95% CI 0.63-0.99, *P* = .044). Patients were also less likely to access telemedicine if they were Hispanic (OR 0.77, 95% CI 0.61-0.97, *P* = .028) or if patients had Medicaid insurance (OR 0.61, 95% CI 0.38-0.97, *P* = .040). We also identified that patients were more likely to participate in a telemedicine visit if they were seen for a urologic condition related to infertility (OR 1.43, 95% CI 1.14-1.80, *P* = .002).

We also evaluated provider characteristics to determine if there were differences in the utilization of telemedicine based on provider attributes. There was no difference in telemedicine usage when stratifying providers by their training type (*P* = .867), age (*P* = .104), or sex (*P* = .228) ([Supplemental Table 1](#)).

In our sensitivity analysis, patients were less likely to access telemedicine if they were older (reference age <55 years), ≥75 (OR 0.66, 95% CI 0.51-0.85), 65-74 (OR 0.74, 95% CI 0.58-0.94) and 55-64 (OR 0.78, 95% CI 0.61-0.99, *P* = .043). Patients were also less likely to access telemedicine if they were Hispanic (OR 0.77, 95% CI 0.62-0.95, *P* = .017) or if patients had Medicaid insurance (OR 0.59, 95% CI 0.36-0.98, *P* = .044). We also identified that patients were more likely to participate in a telemedicine visit if they were seen for a urologic condition related to infertility (OR 1.40, 95% CI 1.12-1.77, *P* = .003) ([Supplemental Table 2](#)).

We performed a secondary sensitivity analysis removing billing codes to identify outlier visits that may necessitate in-person follow up (ie, testicular mass). These results can be found in [Supplemental Table 3](#).

DISCUSSION

In our study we present one largest retrospective analyses of urologic patients who accessed telemedicine during the COVID-19 pandemic. Providers were asked to pre-screen their clinics prior to appointments to determine if patients should be converted to a telemedicine visit. Our analysis demonstrates that telemedicine was routinely utilized by patients over the study period, with 37% of visits being conducted by phone or video. We found that patients who were of Hispanic ethnicity, older, or on Medicaid

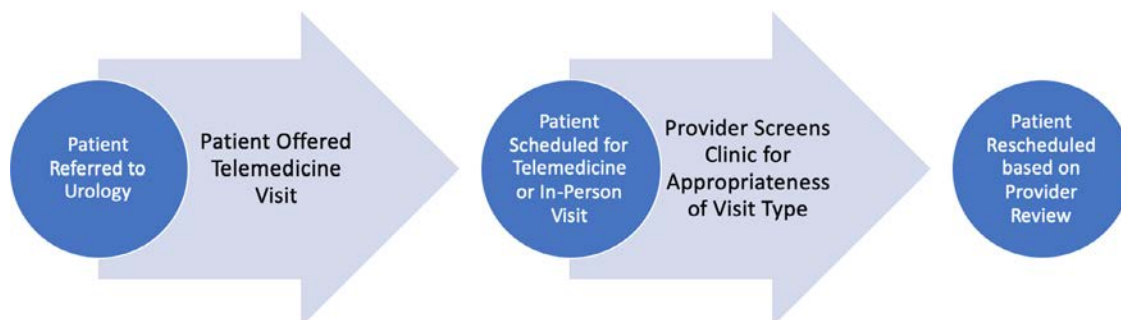


Figure 1. Clinic work flow. (Color version available online.)

Table 1. Demographics

	Patients With Any Visit	In-Person Visits	Telemedicine Visits
Age in Years			
<55	316 (12.6%)	318 (11.9%)	225 (14.4%)
55-64	547 (21.7%)	582 (21.8%)	321 (20.5%)
65-74	948 (37.7%)	1010 (37.9%)	610 (38.9%)
>75	705 (28.0%)	757 (28.4%)	411 (26.2%)
Gender			
Female	2092 (16.9%)	426 (16.0%)	264 (16.8%)
Male	424 (83.1%)	2241 (84.0%)	1303 (83.2%)
Race Ethnicity			
Hispanic	417 (16.6%)	496 (18.6%)	234 (14.9%)
Non-Hispanic Asian	155 (6.2%)	158 (5.9%)	87 (5.6%)
Non-Hispanic Black	99 (3.9%)	105 (3.9%)	57 (3.6%)
Other	159 (6.3%)	187 (7.0%)	104 (6.6%)
Non-Hispanic White	1686 (67.0%)	171 (64.5%)	1085 (69.2%)
Preferred Language			
Spanish	189 (7.5%)	242 (9.1%)	107 (6.8%)
Other	85 (3.4%)	98 (3.7%)	50 (3.2%)
English	2242 (89.1%)	2327 (87.3%)	1410 (90.0%)
Insurance			
Commercial	1264 (50.2%)	1285(48.2%)	771 (49.2%)
Medicare	1159 (46.1%)	1257 (47.1%)	743 (47.4%)
Other	48 (1.9%)	49 (1.8%)	27 (1.7%)
Medicaid	45 (1.8%)	76 (2.8%)	26 (1.7%)
Reason for Visit			
General Urology/Endourology	2300 (54.6%)	807 (51.8%)	1493 (56.2%)
Female Urology	437 (10.4%)	276 (10.4%)	161 (10.03%)
Urologic Oncology	479 (18.0%)	282 (18.1%)	761 (18.1%)
Reconstructive Surgery	110 (4.1%)	46 (3.0%)	156 (3.7%)
Infertility	297 (11.22%)	26 (16.8%)	559 (13.3%)

Table 2. Multivariable regression analysis

Variable	OR	95 % CI	P Value
Race/Ethnicity			
Hispanic	0.77	0.61-0.97	.028
Asian	0.89	0.67-1.19	.455
Black	0.85	0.61-.120	.367
Other	0.86	0.66-1.12	.287
White	Referent		
Language			
Spanish	0.89	0.65-1.23	.510
Other	0.92	0.63-1.35	.695
English	Referent		
Age			
≥75	0.69	0.54-0.88	.003
65-74	0.80	0.64-0.98	.049
56-64	0.79	0.63-0.99	.044
≤ 55	Referent		
Gender			
Female	1.16	0.97-1.39	.099
Male	Referent		
Insurance			
Other	0.97	0.60-1.58	.926
Medicaid	0.61	0.38-0.97	.040
Medicare	1.06	0.91-1.24	.412
Commercial	Referent		
Reason for Visit			
Urologic Oncology	0.90	0.75-1.07	.239
Infertility	1.43	1.14-1.80	.002
Reconstructive	0.69	0.47-1.00	.056
Female Urology	0.94	0.73-1.21	.663
General Urology/ Endourology	Referent		

insurance were less likely to utilize telemedicine. This variation does not appear to be attributable to provider characteristics. Accelerated adoption of telemedicine to provide care in an ambulatory academic urologic setting spurred on by the onset of the COVID-19 pandemic was associated with significant differences in access which may compound existing age, racial/ethnic, and insurance-related disparities.

Until recently, telemedicine utilization was low in large part due to reimbursement related concerns, resistance to change, or patient related factors and concerns.⁵ Lonergan et al evaluated 12,946 video visits at a cancer center and identified no disparities in terms of uptake of telemedicine comparing pre- and post-COVID-19 periods in terms of race/ethnicity, primary language, or payor. However, the authors did not compare telemedicine to in-person visits and it remains unclear if there were disparities in the post-COVID-19 period.⁶ Chao et. al evaluated 109 610 surgical visits and found that urology had the highest conversion rate to telemedicine, 14.3%. However, the authors did not evaluate patient characteristics of telemedicine usage. Our study is amongst the first to look at the specific characteristics of urology patients who are accessing telemedicine. We identified that Hispanic in itself was associated with a lower odds of accessing telemedicine. Rodriguez et al evaluated 162,102 patients mostly from primary care and found that patients who Hispanic were less likely to utilize telemedicine (OR 0.76, 95% CI 0.73-0.80). Our results mirror those of Rodriguez further

indicating that for specialty care like urology there are similar differences in telemedicine utilization.

These findings are also unique in identifying that patient who were older than 60 were less likely to utilize telemedicine compared to younger patients. Nearly two thirds of the urologic population is older than 65 years old. This cohort of patients is also considered to be amongst the highest risk population during the COVID-19 pandemic. Boehm et al interviewed 399 urologic patients in March 2020 and found that patients 76 or older had a negative view of telemedicine.⁴ Narasimha et al reviewed articles focused on telemedicine in geriatric patients and suggested there is limited research in this cohort of patients when designing telemedicine systems. Secondly the utility of telemedicine technology in an increasingly older population of patients and its impact on cognition and behavior is largely unknown.⁷ Our study indicates that there are age related differences in telemedicine usage. This may stem from patient comfort with the use of technology or preference for an in-person visit. Further efforts are needed to address age related disparities in the usage of telemedicine. These can include patient education sessions on telemedicine usage or tablet loan programs.⁸

We identified that Medicaid was independently associated with a lower usage of telemedicine. While this finding might be expected, it highlights that integration of telemedicine usage into routine practice needs to be further evaluated to not disadvantage this patient population. Prior to the pandemic, Medicaid beneficiaries were severely limited in their utilization of telemedicine and there were substantial regulatory barriers that were waived due to the pandemic.⁹ Ray et al evaluated 42,695 pediatric Medicaid beneficiaries in 2014 and demonstrated that telemedicine was used in 146 (0.3%) of visits. Our findings indicate that telemedicine may provide a means of reaching this at-risk population but that focused efforts on identifying patient related barriers are critical to future success.

Lastly, we identified that there was nearly equal uptake of telemedicine by all providers. We did not notice any difference in telemedicine utilization when stratifying physicians by their age, sex, or training (physician or advanced practice provider). Thus, our study indicates that telemedicine can be successfully integrated into physician practice on a routine basis.

Our study has limitations; firstly, our cohort consists of largely older patients. However, we include a robust distribution of patients across all age spectrums and this cohort is most reflective of urologic practices. Secondly, we could not account for unmeasurable inherent provider bias, which may impact the utilization of telemedicine. Third, we identified that infertility related visits were more likely to be conducted via telemedicine, however our practice employs 2 infertility providers and thus it remains unclear if this truly a trend in utilization of telemedicine or bias. Fourth, due to limitations of the database we could not reliably differentiate new patients from follow up patients. Lastly, we could not assess the quality of the visits or visit length, and further analysis of this is needed.

CONCLUSIONS

In conclusion, our results underscore that telemedicine can be successfully integrated into urologic practices but there are disparities in utilization based on patient age, race/ethnicity, and insurance status. Urologic community vigilance is necessary to promote equal access to telemedicine modalities as this technology will continue to be an integral role in future practice.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.urology.2021.11.037>.

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EDITORIAL COMMENT

As Williams and Talwar comment, policy surrounding telemedicine is forthcoming and needed. During the initial emergence of COVID-19 the Center for Medicare and Medicaid Services (CMS) temporarily expanded insurance coverage to include telemedicine.¹ Similarly, most private insurances followed the



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path of CMS and expanded their coverage as well. CMS is finalizing their policy to extend telemedicine coverage into 2023 as many private insurances are doing the same.¹ While coverage is being extended, it remains unclear if this coverage will be permanent, and whether or not telemedicine will continue to offer fair and equitable reimbursements for services.² It is clear from our study that telemedicine can be effectively rolled out in a clinical setting and reach a broad population of patients, and while disparities exist, this should not deter providers from implementing telemedicine into their practice. While most of existing literature on telemedicine has focused on access and satisfaction, further study is needed into outcomes in urology. If future data can support that outcomes are equivalent to in-person visits, then this would further support legislative efforts to maintain telemedicine as a permanent fixture of the urologic care delivery pathway and reach at-risk patients.

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AUTHOR REPLY

Although the COVID-19 pandemic accelerated the implementation of telemedicine, it is likely here to stay even beyond the pandemic, given its ability to improve access to care by reducing logistic barriers for patients like transportation, time taken off from work, and access for rural populations.¹ The rapid adoption of telemedicine resulted in a 12% increase in telemedicine usage among practicing urologists.² Wider use of telemedicine has potential to ameliorate the worsening workforce shortages in underserved areas that do not have practicing urologists.



Despite benefits of telehealth expansion, patients who are older, non-English speaking, and Asian, are less likely to complete outpatient telemedicine visits; patients who are older, female, Black, Latinx, and with lower socioeconomic status are less likely to utilize video visits vs telephone visits.^{3,4} In this study, Javier-DesLoges et al describe a single center's experience utilizing telemedicine for urology visits. The authors identified that patients who were Hispanic, older than age 55 years, and insured through Medicaid were less likely to utilize telemedicine vs in-person visits, and patients being evaluated for infertility were more likely to utilize telehealth visits.

Identifying and reporting these disparities within urology is commendable during this early stage of fully integrating telemedicine into the health care system. More permanent policy from the Center for Medicare & Medicaid Services for regulation and reimbursement of telemedicine is forthcoming. Consequently, interventions to bridge these emerging disparities should accompany continued integration. This may include technical support for patient unfamiliar with video platforms, social services connecting patients with local free and low-cost internet services, and fully integrated, virtual translation services for non-English speaking patients. We must ensure equitable access to this technology early on in order to avoid deepening inequalities in health outcomes among already-vulnerable patient populations.

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