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VOIDING DYSFUNCTION EVALUATION (B BRUCKER AND B PEYRONNET, SECTION EDITORS)

Telemedicine in Overactive Bladder Syndrome

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Abstract

Purpose of Review This review discusses the role and benefits of telemedicine as an integral component of the post-pandemic care paradigm in urological practice and, in particular, as part of the care of patients with overactive bladder (OAB).

Recent Findings The COVID-19 pandemic accelerated the implementation of telemedicine across almost every medical specialty and (at least temporarily) swept away barriers including those regarding reimbursement and licensure. Telemedicine benefits patients and providers alike including savings on transportation costs, access to specialists or tertiary care from geographically remote locations, and minimized exposure to a contagious illness. Integration of telemedicine into clinical practice can reduce costs for office/exam space and staffing overhead, as well as facilitate greater scheduling efficiency. Many, if not most, aspects of care for the uncomplicated OAB patient can be as effectively managed remotely as with in-person encounters, across the treatment algorithm.

Summary Telemedicine will almost certainly remain a key component in the care of OAB, general urology, and throughout all medical specialties.

Keywords Overactive bladder · Telemedicine · OnabotulinumtoxinA · Urology

Introduction

Telemedicine leverages telecommunications technologies for the delivery of medical information and services [1]. While hardly new, legal, regulatory, financial, technological, and behavioral barriers limited widespread adoption prior to the COVID-19 pandemic [2, 3•]. This review discusses the role and benefits of telemedicine as an integral component of the post-pandemic care paradigm in urological practice and, in particular, as part of the care of patients with overactive bladder (OAB).

OAB is a constellation of symptoms including urinary urgency, frequency, nocturia, and urgency urinary incontinence, in the absence of urinary tract infection or other obvious pathology [4••, 5]. The diagnosis of OAB is generally one of exclusion and treatment targets symptomatic relief [4••] OAB is common; epidemiologically, OAB occurs globally and afflicts both genders with some studies showing higher prevalence in women (7 to 27% men, 9 to 43% women), and with increasing prevalence and severity with age [6, 7]. Most patients with OAB have had symptoms for years [7].

A Brief History

The utilization of communications technology to facilitate long-distance delivery of health care, or telemedicine, is nearly as old as the enabling communication technologies themselves. As far back as the 1860s, information relating to the care of wounded Civil War soldiers was transmitted via telegraph. Subsequently, the role of the telephone in medical practice was a recurrent topic in the Lancet beginning within a year of its invention [8, 9]. The modern definition of telemedicine is "the use of electronic information and communications technologies to provide and support

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health care when distance separates the participants" [10]. With the near ubiquity of personal computers, along with increasingly available broadband internet access through the 1990s, telemedicine with interactive video became a practical possibility.

There are benefits and advantages of telemedicine for patients including savings on transportation costs, less or no time off work, no need to arrange for a child or elder care, access to specialists or tertiary care from geographically remote locations, and minimized exposure to a contagious illness. Integration of telemedicine into clinical practice benefits providers as well with reduced costs for office/exam space and staffing overhead, potential scheduling efficiencies allowing greater patient volume, and decreased exposure to a contagious illness. Moreover, patient satisfaction with telemedicine-augmented care is generally high [11–14]. Despite these benefits, telemedicine was slow to gain traction prior to the COVID-19 pandemic. In a German 2019 systematic review, the authors identified multiple barriers to the adoption of eHealth services, including limited exposure/knowledge of telemedicine, lack of necessary devices, and lack of financing [15]. In 2002, Field attributed the slow adoption to licensure restrictions preventing physicians licensed in one state from providing telemedicine encounters to patients living in another state, payer reluctance to reimburse for telemedicine, and physician unwillingness to learn and use new technologies [10].

The 2020–2021 COVID-19 Pandemic

The disruption of in-person care caused by the global pandemic of 2020–2021 cannot be overstated. A survey conducted by the Harvard T.H. Chan School of Public Health, the Robert Wood Johnson Foundation, and National Public Radio found that 1 in 5 (20%) adults in the USA could not get or were delayed in getting medical treatment for serious problems. Over half of these respondents (57%) stated that they had experienced negative health consequences as a result [16]. The reasons for these delays included medical office closures and reduced appointment availability, but also patient reluctance to leave their homes due to fear of exposure to COVID-19 [16]. The pandemic exponentially accelerated the implementation and adoption of telemedicine across almost every medical specialty and (at least temporarily) swept away barriers including those regarding reimbursement and licensure [17]. Key changes to US health care in the post-COVID world are listed in Table 1. Despite the increased flexibility during the pandemic, some pre-pandemic restrictions could be reinstated creating substantial inconvenience for patients located several hours away and across state lines from their provider [18].

Urology was one of the earliest medical specialties to embrace telemedicine utilizing its capabilities for remote robotic surgeries and for mentoring/consultation [19, 20••]. The AUA telemedicine task force noted that telemedicine in urology had been adopted as routine in the

Table 1 Key changes to health care in the United States post-COVID-19 (17) (39)

Change	Result
Health care delivery and reimbursement reform	• Expanded reimbursement for telehealth services through government programs and private insurance
	• Telehealth services a permanent part of healthcare delivery
	• Streamlined licensing requirements for out-of-state telehealth providers
	• Modifications to practice authority for some medical professionals to expand access to care
	• Reduced barriers to mobility for licensed workers
	• Value-based care arrangements
Emphasis on health care equity	• Highlighted health care disparities
	• Targeted funds for communities hardest hit by the virus
	• Requirement for data collection by race and ethnicity in many areas
	• Ensuring access to health care coverage independent of employer-sponsored health insurance
Public health capacity and crisis preparedness	• New crisis response plans with innovative expedited testing, contact tracing and vaccination efforts
	• Pathways for improved speed and quality of public health reporting
	• Increased funding for public health agencies at local and state levels
Connected care programs and digitalization of the value chain	• Accelerated use of artificial intelligence and advanced analytics to stimulate innovation
	• Increased demand for home-based services and virtual care as healthcare moves from high-cost acute care to lower-cost non-acute sites
	• Innovative value-based care arrangements that incorporate remote monitoring of vital signs and electrocardiography to reduced morbidity and mortality

academic setting as well as within national health care systems such as the Veterans Administration [20••]. Pre-pandemic drivers of adoption included the progressively worsening shortage of urologists and increasing emphasis on healthcare value and quality outcomes [20••]. Expansion of telemedicine into routine follow-up accelerated greatly as a result of the COVID-19 pandemic. A pre-pandemic 2019 review concluded that "telehealth is sparingly used in urology" [3•]. In contrast, just months later, a large, urban, tertiary care urology clinic reported that during March 2020, 36% of all consultations were performed via telemedicine whereas none were 1 year earlier in 2019 [21•]. Similarly, the use of telemedicine modalities has also expanded dramatically in gynecology and urogynecology [22]. It seems clear that the widespread utilization of telemedicine, in urology and across all medical specialties, originally driven by a public health crisis, will not disappear once the pandemic has ended.

OAB Treatment Algorithm and Telemedicine

The American Urology Association (AUA) published guidelines for the diagnosis and treatment of OAB in 2012 and updated/amended them in 2019 [4••, 6, 23]. The AUA presents treatment options from least invasive to more invasive including behavioral therapy (1st line), pharmacological management with anti muscarinics or beta-3 agonists (2nd line), peripheral tibial nerve stimulation, onabotulinumtoxinA, or sacral neuromodulation (3rd line), and in rare cases, augmentation cystoplasty or urinary diversion as 4th line options. It should also be noted that the guidelines also mention that, in some cases, no treatment may be an acceptable option. However, OAB may have a significant impact on overall health and quality of life and thus frequently warrants therapy [24].

Many, if not most, aspects of care for the uncomplicated OAB patient can be as effectively managed remotely as with in-person encounters, across the treatment algorithm (Table 2). While the assessment and diagnostic phase cannot be complete without a detailed physical exam, urinalysis,

Table 2 Care for the overactive bladder patient: telemedicine or in office visit

Purpose of visit	Assessments/procedures	Telemedicine	Office/ASC/hospital
Diagnosis	• Detailed history		**X**
	• PRO (e.g., ICIQ-OAB, UDI)		
	• Urinalysis		
	• Physical exam		
	• Post-void residual assessment		
Patient education	• OAB basics	**X**	**X**
	• Treatment alternatives		
	• Symptom control may require attempting multiple treatments		
Treatment			
Behavioral	• Bladder control strategies	**X**	**X**
	• Bladder training		
	• Fluid management		
	• Pelvic floor muscle exercises		
Pharmacologic	• May be combined with behavioral	**X**	**X**
	• Rx		
Third line	• BTX, PTNS, SNS		**X**
Fourth line (surgical)	• Augmentation cystoplasty or Urinary diversion		**X**
Routine Follow-up	• Assess compliance/efficacy (diaries; 24 h pad weight)	**X**	**X**
	• PRO (e.g., ICIQ-OAB, UDI)		
	• Side effects/complications		
	• Treatment changes		
Surgical follow-up	• As above, but include in-person postoperative check and subsequent re-exams as indicated	**X**	**X**

OAB, overactive bladder; *ASC*, ambulatory surgery center; *PRO*, patient-reported outcomes; *ICIQ-OAB*, International Consultation on Incontinence Questionnaire-Overactive bladder; *UDI*, Urogenital distress inventory; *BTX*, botulinumtoxinA; *PTNS*, peripheral tibial nerve stimulation; *SNS*, sacral neuromodulation

and perhaps ultrasound for post void residual (PVR) volume in select patients, nearly all aspects of follow-up can theoretically be managed virtually. Educational videos for patients exist for OAB, and behavioral training may be provided remotely. With the uncomplicated patient, all routine follow-ups including review of diaries, probing for any adverse events and medication tolerability, completion, and review of quality of life questionnaires, and discussion of therapeutic changes or retreatment (e.g., onabotulinumtoxinA) may be managed using a telemedicine platform. Sacral neuromodulation program changes can now be made by the patient (under the direction of their physician) using a smartphone-like device [25]. Additionally, given that persistence and compliance with OAB medical therapy are known to be challenging, telemedicine may allow for more frequent check-ins to optimize adherence and assess for side effects [26]. These suggestions are also consistent with recently published recommendations for general urology and female pelvic medicine and reconstructive surgeons where behavioral, conservative, and medical treatment modalities are considered most appropriate for virtual encounters [27••, 28••].

The expansion of telemedicine has been mirrored by the expansion of other health quality and efficiency initiatives such as the implementation of navigation models. Navigators are generally registered nurses, nurse practitioners, or physician assistants. Navigators assist patients with care management of their chronic and complex conditions facilitating timely access to care and reducing barriers to treatment. Navigators coordinate patient care addressing the patient as a whole, create and foster partnerships within a multidisciplinary team, improve patient outcomes through the encouragement of patient self-management and health literacy, and facilitate system improvement by providing a leadership role and acting as an agent of change [29]. Navigators are often called upon by patients (often via telemedicine) to ask questions about their condition and treatment plans after the physician has spoken to them [30].

Finally, with electronic medical records, communication between the OAB patient's urologist or urogynecologist with other providers in their continuum of care (e.g., Primary Care, Cardiology, etc.) is readily facilitated through virtual means, particularly when all are part of a large multi-specialty system or group [31].

A small minority of OAB patients with complicated, severe, and refractory OAB require surgical treatment, augmentation cystoplasty, or urinary diversion, to achieve symptom control [32]. Augmentation cystoplasty cases have become increasingly rare, particularly since the introduction of onabotulinumtoxinA therapy [33]. In either case, post-operative follow-up will continue for the patient's lifetime as long-term complications such as renal functional deterioration, ureteroenteric strictures, metabolic disorders, stoma complications, and recurrent infections occur in up to 60% of patients [34]. Post-operative follow-up for these patients could follow a hybrid approach. It has been shown that remote surgical wound assessment is feasible and safe [35, 36]. In-office encounters may be scheduled as needed depending on individual patient circumstances.

Reimbursement and Licensure

Telemedicine and telehealth make many new and advantageous tools available for efficient and high-quality medical care delivery. While there are historic barriers to adoption including state licensure restrictions and reimbursement by Medicare and private insurers, many of these were swept aside (at least temporarily) during the COVID-19 pandemic with subsequent extensions and the possibility of permanent changes. In March 2020, the federal government relaxed telemedicine visit restrictions and set payments at par with in-person visits. States and private insurers (in many cases) followed suit. Medicare added over one hundred billing codes for the duration of the COVID-19 public health emergency, which is slated to end on May 11, 2023. Some telehealth codes are only covered until the Public Health Emergency Declaration ends, whereas others will be permanently covered in the Physician Fee Schedule.

Licensure requirements have been perhaps the most intractable issue and are particularly important when large metropolitan areas with a concentration of medical specialists and tertiary care facilities are proximal to a state border. Physicians have been required to be licensed in the state where care is delivered. From a telemedicine standpoint, this is the physical location of the patient and not that of the provider. With the growing use of telehealth, many states are revising their licensure process to balance preserving state regulatory oversight while minimize barriers to access. Initiatives such as the Interstate Medical Licensure Compact, which currently includes 37 participating states, streamline the licensing process for physicians who want to practice in multiple states offering a voluntary, expedited pathway to licensure for physicians who qualify [37••]. Temporary, emergency licensure requirement relaxation was implemented in many states but will generally expire with a resolution of the state of emergency [38].

Future Directions

What will telemedicine look like in the decades to come? [39] Forty years ago, it would have been difficult to imagine the real-time audio/video encounters with patients that are now commonplace. This is just the beginning. Communication technology continues to evolve and change almost daily. Will home ultrasound devices allow PVR to be assessed in

a virtual encounter? Will other diagnostic tools and tests become available for home use? Urine analysis dipsticks already exist; could a smartphone app be developed allowing accurate microscopy, analysis, and/or organism identification? Will encounters blend at-home diagnostics and send-in tests? If you can imagine it, you can create it. From a regulatory standpoint, the barriers to the practice of interstate medicine seem to be gradually loosening. Will federal or national level licensure be possible?

Conclusions

Telemedicine benefits both patients and providers. Patients gain access to their medical providers from the comfort of their homes. The time spent in travel or waiting rooms is saved. Arranging for transportation is unnecessary, and the costs associated with fuel, public transportation, and/or parking are saved. Child, elder, or pet care while away is no longer an issue. For the OAB patient, the anxiety of being away from home and possibly distant from a lavatory when one is needed is removed. For the provider, there are efficiencies to be gained in scheduling, patient flow, and reserving in-office encounters for those patient visits that require in-person contact. The many advantages of telemedicine became obvious with the involuntary adoption forced by the COVID-19 pandemic; these advantages translate well to a non-pandemic world. Telemedicine will almost certainly remain a key component in the care of OAB, general urology, and throughout all medical specialties.

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Declarations

Conflict of Interest Dr. Jericevic declares that she has no conflict of interest.
Dr. Brucker reports he is an advisor for Wakins-Conti, Investigator speaker and advisor for Allergan an advisor and speaker for Urovant, advisor for Click Theraputics, Investigator for Boston Scientific outside the submitted work, advisor for Anteres.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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•• Of major importance

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