Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Telemedicine and Smart Working: Recommendations of the European Association of Urology

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Article info

Abstract

Context: Telemedicine provides remote clinical support using technological tools. It may facilitate health care delivery while reducing unnecessary visits to the clinic. The coronavirus disease 2019 (COVID-19) outbreak has caused an abrupt change in our daily urological practice, converting many of us to be reliant on telehealth.

Objective: To provide practical recommendations for effective use of technological tools in telemedicine.

Evidence acquisition: A Medline-based and gray literature search was conducted through April 2020. We selected the most relevant articles related to "telemedicine" and "smart working" that could provide important information.

Evidence synthesis: Telemedicine refers to the use of electronic information and telecommunications tools to provide remote clinical health care support. Smart working is a model of work that uses new or existing technologies to improve performance. Telemedicine is becoming a useful invaluable tool during and even beyond the COVID-19 pandemic. It is time for us to formalize the place of telemedicine in routine urological practice, and it is our responsibility to adapt and learn about all the tools and possible strategies for their optimal implementation during the pandemic to ensure that the quality of care received by patients and the outcomes of patients and their families are of the highest standard.

Conclusions: Telemedicine facilitates specialized urological clinical support at a distance, solves problems of limitations in mobility, reduces unnecessary visits to clinics, and is useful for reducing the risk of viral transmission in the current COVID-19 outbreak. Furthermore, both personal and societal considerations may favor continued use of telemedicine, even beyond the COVID-19 pandemic.

Patient summary: Telemedicine in urology offers specialized remote clinical support to patients, similar to face-to-face visits. It is very useful for reducing unnecessary visits to the clinic, as well as reducing the risk of contagion in the current coronavirus disease 2019 (COVID-19) pandemic.

1. Introduction

The current coronavirus disease 2019 (COVID-19) pandemic is creating huge pressure on our health care systems and has led to dramatic changes in our daily lives. Many countries have enforced strict controls on movement and socializing in an effort to manage the pandemic. Protective measures have dramatically changed the way we practice clinical medicine and the expectations of our patients. Health care must adapt quickly and recommendations have been published to aid triage the priority of urological surgeries [1–6]. Many centers are rapidly converting their on-site care activity to telemedicine, which has rapidly become a reality in many new settings [7]. It is expected that many patients will spend long periods of confinement at home, so the occurrence/exacerbation of urological symptoms or the interruption of follow-up may generate anxiety and a feeling of helplessness. Nowadays, one of 10 individuals in the world is older than 60 yr; by 2050 this number will double to one in five [8]. Although urological diseases affect a broad spectrum of age groups (from prenatal to advanced age), many urological diseases are found in persons at the highest risk of adverse outcomes from COVID-19 (advanced age and male gender) [9]. As such, it is desirable to reduce unnecessary face-to-face medical visits, hospital emergency visits, and home emergency calls in order to avoid unnecessary contacts; to protect patients; and to reduce the burden of care and consumption of resources. It is evident that some aspects of health care delivery can be solved through the use of technology [5].

As telemedicine has been used in previous epidemic outbreaks, it has rapidly been incorporated into solutions to manage COVID-19 patients and in several countries for continuation of specialty care such as urology. Examples include isolation of patients in Taiwan during the severe acute respiratory syndrome (SARS) epidemic in 2003, H1N1 pandemic influenza in 2009, as well as H7N9 influenza infecting patients in 2013 in China [5,10]. Many legal, privacy, and billing issues are involved, but they are being rapidly adapted due to the COVID-19 crisis [11,12].

The actual situation due to the COVID-19 epidemic is exceptional, and telemedicine is becoming a useful tool during and even beyond the pandemic. It is difficult to predict how long the pandemic will last, and social distancing may become the "new normal" behavior for a long time. Even after the pandemic, telemedicine offers many potential advantages such as patient convenience and a reduction in transportation-related emissions. It is time for us to formalize the place of telemedicine in routine urological practice, and it is our responsibility to make efforts to adapt and learn all the tools and possible strategies for its optimal implementation. Our aim is to provide practical recommendations for appropriate and effective use of technology tools in virtual medicine.

2. Evidence acquisition

This review will cover the current scenario in which telemedicine is used for daily urological practice. We conducted a comprehensive English-language literature research for original and review articles using the Medline database and gray literature through April 2020. We searched for the following terms: "COVID-19 outbreak" or/and "smartworking" or/and "telemedicine" or/and "tele-health" or/and "urology." The combination of "COVID-19 outbreak" with each of the other terms found 149 related articles. The consistency of these recommendations is affected by the inherent lack of robust evidence in urology.

3. Evidence synthesis

3.1. Landscape and considerations

Telehealth refers to the use of electronic information and telecommunication tools to provide remote clinical health care support, professional and public health education, and health administration [5,12,13]. Telemedicine is used as a synonym or used in a more limited sense to describe remote clinical services, such as diagnosis and monitoring [14,15]. Smart working is a model of work that uses new or existing technologies to improve performance; it is linked to the concept of flexibility and teleworking. Any innovative idea is applicable, and the concept of working from anywhere including cafeterias, coworking spaces, and especially home is advocated. Smart working is used by companies in different areas such as finance, support services, and consultancy [16,17]. Telehealth (including telemedicine) can potentially include any communication technology such as e-mail, telephone, messaging, calling, video calling, video streaming, data storage, imaging, video conferencing, and webinars. However, the implementation of these technologies requires addressing challenges with privacy, reimbursement, and other organizational issues [4,5,12,13].

3.2. Benefits of telemedicine in the COVID-19 pandemic

1 Reduces spread of coronavirus (SARS coronavirus 2 [SARS-CoV2]) from infected patients with or without

symptoms (an important feature, as virus can spread before the onset of symptoms and after recovery).

2 Reduces contamination of uninfected persons.

3 Reduces transmission to hospital workers and hospital surfaces.

4 Makes it possible for health care professionals who are positive for COVID-19 or at high risk for adverse outcomes to work while they are still isolated at home.

5 Makes clinic visits more convenient for patients and, possibly with time and practice, can increase efficiency as part of the armamentarium for clinicians.

6 Provides satisfaction: recent patient satisfaction data show that patients are embracing telemedicine to a surprising degree, particularly for follow-up care [18].

3.2.1. Telemedicine and smart working benefits beyond COVID-19 pandemic

Air pollutants emitted by commuting traffic contribute to respiratory disease. Emissions from cars and other forms of transportation contribute to the greenhouse gases that lead to climate change. When used to replace some travel to and for work, work from home (WFH) avoids these emissions and can help improve regional air quality and protect the environment [19].

Buildings use energy to heat, cool, and light offices and to run equipment. Office buildings account for nearly one-fifth of all commercial energy consumption, and nearly three-fourths of that is used for lighting, heating, cooling, and powering office equipment. If the amount of office space is reduced, emissions from electricity use are likely to be lowered as well. The net savings depend on the changes in the use of space and equipment at both the office and the telework location.

WFH is one way to increase the pace of developing and delivering products and services whether by avoiding time lost to emergencies or transportation delays. Smart working can increase productivity by allowing workers to avoid distractions as well as replace some commuting time with working time [20].

3.3. How to pursue telemedicine and smart working in urology?

Telemedicine is a coordinated team effort that includes urologists, nurses, secretaries, and administrative staff and interdisciplinary coordination with other services, such as laboratory, radiology and oncology, and health care IT technicians.

3.4. Access to patient record and data

Records and data must be electronic in compliance with privacy and data protection regulations. In the European Union (EU), this must be in compliance with the General Data Protection Regulation (GDPR), which is a regulation law on data protection and privacy. It also addresses the transfer of personal data outside the EU. The GDPR aims to give control to individuals over their personal data and simplify the regulatory environment for international business by unifying the regulation within the EU [21]. Each country, region, health system, and hospital has its own program for managing, in a safe way, data from medical records, images, and diagnostic and laboratory tests. It is desirable that this can be accessed from any computer/device and place, even from home; if this option is not available, the hospital administration should consider providing remote access to the virtual private network (VPN).

3.5. Scheduling patients

It is desirable to provide different methods for patients to schedule their visit, including websites, e-mails, phone numbers, or mobile applications. A prior call from the clinic team, text messages, or e-mail reminders are recommended to verify that the patient knows how to access the visit and has any necessary records available. Patients can upload medical records directly to their chart via a smartphone or PC, so that doctors can see their tests or imaging results from other facilities during consultation. A patient agenda must be generated and managed with the help of the telenursing team and administrative staff. With telemedicine, scheduling of patients can be done in a flexible way.

3.6. How to contact patients and make a televisit?

Patients can be contacted via a simple call, video call, e-mail, text message, specific software, or mobile application. The most interactive way to make a televisit seems to be a video visit; you can document a limited physical examination by guiding the patient through it. However, platforms with the capacity to carry out video visits with secure data protection may be limited in many countries, due to privacy, billing, and cost issues. Furthermore, some patients may have difficulty connecting to a video visit for technical issues. In such a case, a telephone call may be the best option. Telemedicine applications alone are usually less interactive and may not have enough support when compared with a telehealth platform (Fig. 1).

3.7. How to perform telemedicine triage?

Performing the best teleconsultation is based on managing a good triage. Classifying patients into groups is crucial, for example, (1) patients on first consultation or follow-up for oncological versus nononcological pathologies, (2) patients with an acute consultation reason (eg, urinary infection, flank pain, and hematuria), (3) patients who potentially need a complementary face-to-face study (eg, for cystoscopy or imaging tests, such as ultrasound or computed tomography), (4) patients who really need to go to the emergency room or outpatient office for a procedure (eg, catheterization for acute urinary retention and renal colic with fever), and (5) patients with a diagnosis who potentially need a surgical intervention.

In a globalized world, patients might require interpretation services. Currently, this is not available directly within some telemedicine platforms such as EPIC. However,
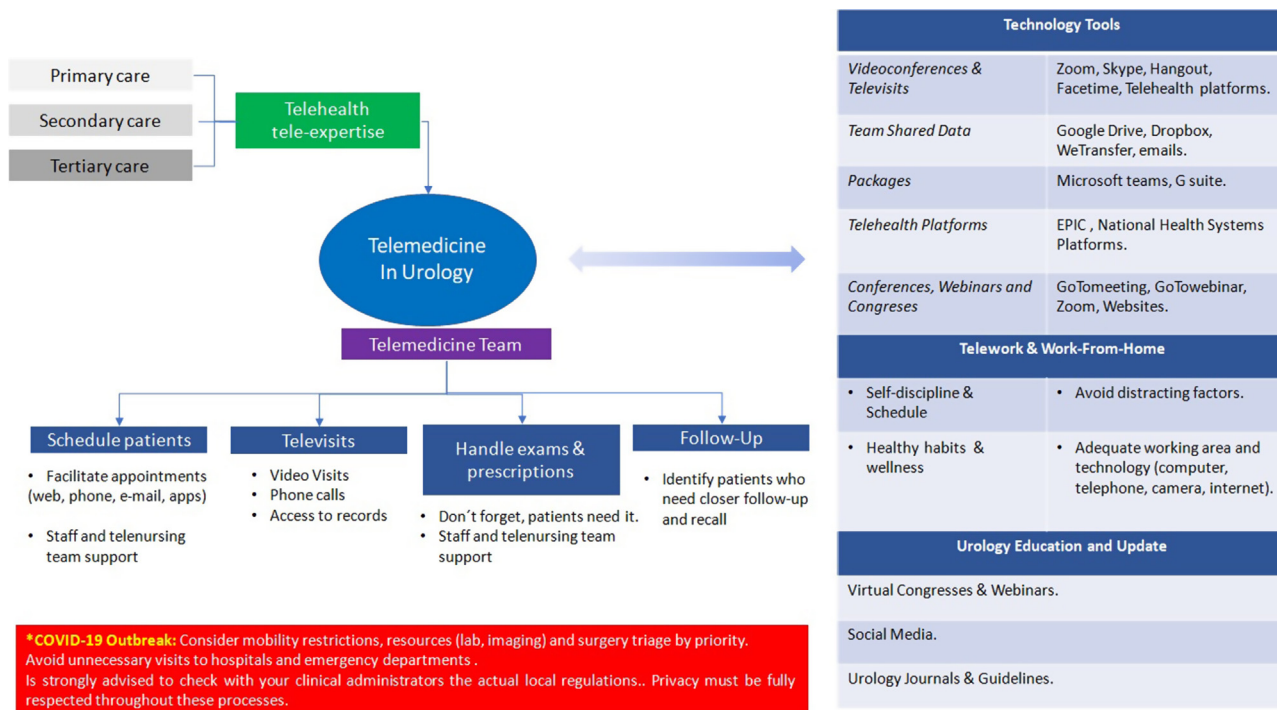
Fig. 1 – Telemedicine applications and telehealth platforms in urology. COVID-19 = coronavirus disease 2019.

institutions should strive to contract a "language line" telephone service or other options to facilitate translation services.

3.8. Informed consent in the clinical record

It is important to document all data in the clinical record such as a face-to-face consultation within the best clinical practices. The note should include a disclaimer, such as "teleconsultation is provided with the consent of the patient."

3.9. Manage complementary diagnostic exams

In a clinical environment, the request for laboratory tests or diagnostic images can be managed through the virtual private network. However, in an outpatient or telemedicine setting when the patient is from another geographical area, it may mean sending the corresponding requests via a secure encrypted e-mail. Many patients will need requisitions for laboratory or imaging tests, some of them with relative urgency. It is important to be able to send files safely, through secure e-mails on a regular basis. One example of a secure encrypted application is Doximity. It offers different ways to reach patients from mobiles, without sharing private number. The Doximity application integration into Epic Haiku allows doctors to call patients directly from their charts [22].

The COVID pandemic is exceptional, with limited patient mobility and health resources. The request for complementary examinations must be made in a rational way, considering that many outpatient imaging departments and laboratories are working under exceptional conditions and serving primarily COVID-19 patients during this critical time period. Consideration should be given to deferring nonurgent laboratory and imaging tests depending on the clinical urgency of the test, patient age and health status, and the local COVID-19 situation [7,23,24].

3.10. Follow-up consultation

At the follow-up visit, the telemedicine team should make sure that the results of the complementary tests being requested are available to the doctor. After the results are available and clinical decisions can be made, it is recommended to send the reports to the patient and the visits should be scheduled, although in some countries these are visible to the patients within their electronic records. In the current pandemic, it is understandable that follow-up visits in low-risk patients may be scheduled later than usual.

3.11. Telemedicine platforms

A platform that integrates secure data management and access into electronic records, as well as the ability to allow video visits in an integrated way, is desirable. There is a need for integrated telehealth platforms in many European countries (within a legal frame). Currently, there are commercially available platforms such as EPIC (EPIC, Verona, WI, USA) medical record system and NHS Attend Anywhere [7]. During the outbreak, EPIC is being used successfully in the USA. However, the response capacity for rapid implementation of platforms such as these during a

crisis such as a pandemic is limited in many countries due to costs and regulations (Table 1).

3.12. How to interact with other telemedicine team members?

Continuous communication with the team is crucial. Regular channels such as calls, e-mails, and messaging are used. Online applications such as Zoom, Hangouts, and Skype can be used for video conferences, although this may depend on country restrictions and special care should be taken in terms of data sharing. Zoom usage has increased during the COVID-19 pandemic; with millions of people around the world working from home, this practice has brought attention to privacy. By the time of this recommendation, the Zoom service does not support end-to-end encryption for video and audio content [25]. Some paid corporate packages, such as Microsoft Teams and G Suite, offer e-mail services with business domains, storage capacity, and spreadsheets that allow real-time updates, chat channels, agendas, calendars, and business group video conferencing tools, which offer better performance than free versions with an increasing number of users. The recommendation of this panel is to use safe applications in terms of privacy and make secure encrypted databases for patient follow-up tasks, which can be updated and made available to the entire team. Check with your clinical administrators and become familiar with current local regulations prior to adopting these technologies.

3.13. Dealing with teleworking and working from home

Working from home requires self-discipline, order, and organization. It is advisable to make schedules of activities and patient agenda, and respect the time as if it is a face-to-face consultation. Prepare an adequate work area at home, including appropriate surroundings that protect the patient's confidentiality, with available technology including a computer, Internet connection, video camera, and microphone, as well as professional attire. Maintain good communication and enthusiasm with the team. Maintaining healthy habits and routines helps improve productivity [16,17].

Table 1 – Telehealth platforms capabilities.

	EPIC	NHS Attend Anywhere
Access to medical records	Yes	Yes
Connection to the National Health System	NA	Yes
Connection to hospital/clinic VPN	Yes	Yes
Video visit capability	Yes	Yes
Doctor's access to lab test/images/prescriptions	Yes	Yes
Safety in compliance with privacy regulations	Yes	Yes
Billing in compliance with regulations	Yes	Yes
Patient consent form	Yes	Yes
Patient information	Yes	Yes
Translation services	No	No

NA = not applicable; NHS = National Health System; VPN = virtual private network.

3.14. Urology education and telemedicine

The year 2020 is an exceptional year as the annual congresses of the European Association of Urology (EAU) and the American Urological Association were physically suspended and have become entirely virtual due to the COVID-19 pandemic. Now it is crucial, more than ever, to keep learning and sharing knowledge through virtual platforms [26,27], including social media channels such as Twitter, Facebook, and Instagram, as well as urological webinars organized by the different associations [28–31]. Several platforms can be used to create webinars and congresses, for example, LogMeIn (https://www.logmeininc.com/) offers platforms such as GoToMeeting, GoToWebinar, and GoToTraining, which allow us to organize webinars, meetings, and virtual congresses in a relatively simple way, with accessible prices and complying with the European regulation on secure data protection. However, even simple ideas such as live streaming through online applications and platforms such as Facebook, Instagram, or Zoom can be an option to broadcast a video conference. Privacy must be respected fully throughout these processes.

3.15. Privacy and Billing

Adherence to the data privacy policy is essential. It is advisable to use secure communication channels to protect the confidentiality of patient data. Platforms provided by the institution are most recommended [13]. Privacy and billing regulations vary across different regions and countries, which have been complicated further by the rapidly changing COVID-19 situation [11,12]. Once again, it is strongly advised to check the local regulations with your clinical administrator.

3.16. Limitations and risks

A limitation of televisits is that a conventional physical examination cannot be performed. On the contrary, a self-examination directed by the physician may be a reasonable option, especially in video visits [4,11]. In addition, it is not possible to obtain ancillary tests (such as urine dipstick, postvoid residual urine measurement, and laboratory testing) during the encounter; therefore, any important tests that are required have to be conducted separately. Billing telehealth has been described as an important issue. Billing conditions vary in each country and are complicated; however, changes in telemedicine regulations and WFH policies are being considered, and we should be encouraged to study and adapt to each country and region. Confidentiality is another problem; however, by following recommendations, and using proper channels and common sense, we can solve them. Regulatory considerations on confidentiality are also being addressed. Patients should be notified of what protections are in place and a disclaimer should be included in clinical documentation. Some urologists may not have previous experience with smart working and telehealth; potential challenges include scheduling televisits, team meetings, self-discipline, dis-

tractions from WFH, feelings of loneliness, loss of motivation, depression, disruptions from family life inside the home, and creating a professional work environment remotely. Reviewing strategies on how to deal with WFH can be very helpful.

3.17. Good practice recommendations on telemedicine and smart working

These recommendations attempt to provide best practices for applying telemedicine in urology. The COVID-19 pandemic is changing rapidly, and these recommendations will need to be updated regularly:

1 Keep up-to-date on innovative strategies and learn to manage platforms and tools that allow communication with patients, communication with other team members, and safe data sharing.
2 Provide patients with different methods for scheduling of visits. Contact them in advance to agree on the schedule of consultation and provide instructions on how to access the visit. Provide a telephone number for urgent consultation and red flag symptoms, and avoid unnecessary visits to the hospital.
3 During video visits, have a quiet and private environment, and make sure that the patient has it too. Preferably the patient should be alone or with a relative who may help with technical issues. Laptops and desktop computers are preferable to cell phones. Ensure a quiet, nondistracting background and adequate lighting with good audio. The camera should be placed at the eye level. Try to wear professional "work" clothes. Manage your body language and analyze the patient's body language. Offer advice to perform a guided physical self-examination. For patients who cannot establish a video visit for technical reasons, a phone call may be an alternative [4].
4 Not having a specific application is not a reason for not doing telemedicine. Even a simple phone call and access to medical records, managed by a urologist or nurse, can help temporize urological issues and concerns during a pandemic emergency.
5 Hospital phones should be used for phone calls. If you use your personal mobile, it is better to set it up in the phone

configuration and settings not to show your personal number. The Doximity application is an option, for example.
6 Triage patients using common and clinical sense [1–3].
7 Send reports and prescriptions, conduct laboratory and imaging tests, and schedule face-to-face procedures (eg, cystoscopies) if necessary, with the support of a nursing and/or administrative telemedicine team.
8 Maintain constant communication with the team during a televisit.
9 Familiarize yourself with the available options for e-mail, video conferencing, calendars, social media, packages, telehealth platforms, and webinar platforms. Check with administrators about the local regulations prior to adopting these technologies.
10 Comply with the privacy and billing regulations in your country and region.
11 If you WFH, self-discipline is crucial. Set schedules and avoid distracting factors when you are working, like a face-to-face job [4]. Create healthy routines and keep motivation high. Find a balance with any family member at home.
12 Keep yourself updated academically by following the virtual congresses, webinars, guidelines, and articles from the official channels of urological associations (https://uroweb.org/). Exchange knowledge and ideas through social media [12,13].
13 Arrange update and scientific meetings by videoconference. Discuss relevant clinical cases and new strategies with evolving situations.
14 Try to generate and share quality content for the population and patients. Remember, you are a health professional, and there is a substantial need for dissemination of high-quality health information particularly during a public health crisis.

Try to adhere to recommendations, follow your local policies, and avoid misconducts (Table 2).

3.18. Challenges and future directions

In the current scenario, we must make efforts to ensure the feasibility of telemedicine and smart working. These tools are useful during this crisis and probably are here to stay. It is the duty of national and regional associations, as well as the

Table 2 – Inappropriate telemedicine behaviors.

Misconduct	Example
Not asking for consent to televisit	Not informing change from face-to-face visit to televisit at the beginning of the consultation
Communicating sensitive information through improper channels	Informing a diagnosis of cancer through a text message
Not using proper channels under the privacy and billing laws of the country	Billing a consultation as face to face using channels or applications outside of the country's laws
Not sending reports and prescriptions that have been offered	Not sending treatment prescription taken on a regular basis
Inappropriate televisit and WFH	Wearing informal clothes, and using a nonprivate environment to inform the patient
Not properly managing a patient who needs face-to-face care	Not recommending face-to-face care to a patient with lumbar pain and fever

WFH = work from home.

urology departments of each institution, to find strategies adapted to their local setting. We must look for simple and effective strategies in the short term, and think about medium- and long-term strategies. No one currently knows how to return to "normal clinical practice" when the incidence of COVID-19 drops. Everything seems to suggest that face-to-face consultations are going to be restricted for an indeterminate period of time, and we have to evolve with telemedicine and virtual medicine quickly. An important issue is access to health care, which can be problematic for individuals in rural areas; this is another population that may benefit in the long term from greater expansion in telemedicine [32].

Institutions should build up telemedicine programs according to each department's needs. This includes defining the types of services to offer (eg, first consultations, follow-ups, rapid test reading, or imaging) and how telemedicine will be delivered. After defining the needs, the planning phase, where timelines and task lists are created to launch and maintain the telemedicine program, is defined. This includes the following:

1 Define the target of patients and pathologies to be included in the telemedicine program and schedules to be followed (eg, low-risk prostate cancer follow-up, benign prostatic hyperplasia with low to moderate symptoms, etc.)
2 Select enthusiastic and motivated people and give specific training.
3 Determine the hours necessary to complete the tasks and create an implementation timeline.
4 Discuss and create the materials necessary to shape the telemedicine program.

The final stage is implementation and feedback. Implementing of a telemedicine program implies an organizational change in the departments, and similar to all changes, it is about people. Technology is a cornerstone of telemedicine programs; however, successful implementation requires the ability to build the best team.

4. Conclusions

Telemedicine and smart working provide specialized clinical support for urologists at a distance using technological tools, as a logistically feasible alternative to face-to-face consultation. This novel way of medical practice reduces unnecessary visits to medical facilities, and it is useful for reducing the risk of transmission in the current COVID-19 pandemic. Furthermore, both personal and societal considerations (eg, greenhouse emissions and greater efficiency) may favor continued use of telemedicine when applicable, even beyond the COVID-19 pandemic.

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