COVID-19 crisis and the opportunities to advance telemedicine

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TO THE EDITOR,

During the coronavirus-19 (COVID-19) crisis, the global medical community invested a great deal of effort to balance the best patient care with minimal physical exposure. Telemedicine was one of the tools that was used. The wider use of the term "telemedicine" includes all medical services between a patient and their healthcare provider without an in-person meeting. The term encompasses telephone calls, digital medical documentation transferred to the clinician, and synchronous or asynchronous video conferencing. Telemedicine provides access to medical services to patients who are unable to meet their healthcare providers because of geographic distance, physical or medical complexity of the patient's condition, and limited mobility (e.g., elderly).

For successful use, telemedicine needs to achieve the correct combination of provider motivation and need, patient compliance, and technical capabilities (including legal and payment issues). Although telemedicine has been thoroughly discussed as a viable tool, the global COVID-19 pandemic accelerated its implementation, showed the advantages, and provided an opportunity to address limitations. Hollander et al. [1] discussed the important role of telemedicine during the COVID-19 crisis; it served as a forward triage, allowing efficient screening of patients while in their homes. Patients were directed to the correct department, thus reducing the need for patient transportation, decreasing potential virus exposure, and lowering healthcare costs.

The ability to communicate 24/7, to take advantage of specialists from multiple institutions simultaneously, and to allow quarantined medical staff to be in contact with patients and colleagues, allowed the remaining hospital staff to assist patients. In addition, during the pandemic tele-visit systems for hospitalized patients were used to reduce exposure for both healthcare providers and visitors [1].

As the COVID-19 emergency situations subsides, and with it the crucial benefits of reducing contamination, other medical situations where telemedicine is effective will become apparent. These advantages are referred as the 4 Cs and include: better access to Care, greater Convenience, enhanced patient Comfort, and better Confidentiality. A fifth C, Contagion, was added during the COVID-19 crisis [2].

In addition to being a tool for patient–provider communication, telemedicine can be used for tele-assistance, when a primary healthcare provider needs advice from a specialist or a second opinion and other providers are not physically accessible. This provider-to-provider format enables consultation with more professionals at the same or other institutions or even in different countries, thus increasing the support provided by more experienced specialists. In addition to primary screening, triage or hospital tele-visits and tele-assistance, telemedicine can serve as an additional tool for follow-up and treatment interventions. These technologies can be implemented for patients with chronic disorders such as metabolic diseases and neurological or psychological conditions or for those presenting with conditions that require long follow-up periods.

The remote communication in a familiar environment is an advantage for home monitoring when, for example, daily functioning needs to be evaluated. For some conditions, remote care can be conducted via video conferencing with a healthcare provider. These remote visits can help medical staff evaluate progression, reduce specific symptoms, record specific activities. Indeed, there are studies showing that the feasibility and effectiveness of remote care is growing. Staff training can also be accomplished via telemedicine [2].

The limitations and barriers for healthcare providers to use telemedicine include reimbursement issues, legal concerns such as patient data protection, and secure data delivery, processing, and archiving. These issues must be addressed when implementing new telemedicine platforms. The COVID-19 crisis accelerated these processes and various solutions were suggested and implemented. New methods for reimbursement are being investigated by hospitals and medical insurance companies [1,2].

From my point of view as a specialist in oral medicine, evaluation of the visual characteristics of oral mucosal lesions is mandatory for diagnosis, follow-up, and treatment decisions, such as in cases of premalignant conditions. The need for visual evaluation is common for other fields such as dermatology. To overcome these limitations, digital telemedicine allows clinical pictures to be taken at the patient end and evaluated by the clinician. The store-and-forward option is an easy, flexible, and low-cost solution.

Another useful format for telemedicine is live video conferencing, which is more accurate but requires good internet capabilities at both ends. Each method has its advantages and limitations [3]. The use of smartphones is a simple and easy method for immediate visual consultations, although it should be done cautiously, due to privacy considerations and data protection issues.

Obviously, there are situations in which a physical clinical examination is mandatory, either for a first-time patient assessment or for specific conditions, thus telemedicine should be implemented wisely. As the use of telemedicine becomes more prevalent, each medical field should define or update its

own guidelines for use based on medical and behavioral characteristics of the patients while maintaining the standard of care.

In parallel to the incorporation of telemedicine into healthcare systems, there are exciting technological developments, such as sensors, smartphone applications, and mobile or wearable devices.

Some simple smartphone applications are already commonly used, such as step counters, fall detectors, and heart rate sensors. Wearable and mobile devices can be used for functional assessments and with further development, may become digital biomarkers. These new technologies enhance the possibilities for telemedicine [4]. The enormous amount of medical data gathered will be the basis of big data studies and artificial intelligence may assist in decision making processes.

The use of new digital, mobile, and remote communication tools raises the question of patient compliance. The COVID-19 crisis showed that public compliance with the digital tools is much higher than initially assumed. Smartphone applications, internet-based communication and wearable devices are mainly used by younger people. Tools such as video conferencing applications (e.g., Zoom Video Communications platform) and smartphone applications were quickly adopted and used by all sections of the population [2].

The COVID-19 crisis encouraged healthcare providers, patients, and institutions to experience the possible applications of telemedicine. Health insurance and medical organizations found ways to incorporate these services, and financial and legal issues were addressed. Patients showed a willingness to use the digital tools. Mobile digital tools were implemented in hospitals and public health systems, increasing awareness and acceptance of these tools.

There are still challenges to guarantee that networks are secure, to ensure that the staff is adequately trained, and to address the legal and reimbursement issues. Despite the challenges the medical community should take advantage of the opportunities that the pandemic has highlighted and find ways to improve patient care using technologies to make medical service better and safer for all.

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Capsule

Recombination and origin of SARS-CoV-2

A burning question in research on severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has been the origin of the virus and its relationship to other known corona viruses, including those that have caused past disease outbreaks. Analysis of their evolution must consider the high frequency of recombination between different corona viruses. **Li** et al. performed an analysis of recombination break points across the SARS-CoV-2 genome coupled with phylogenetic and structural analysis of the sequences between the break points. They provide evidence that the receptor binding domain of the spike protein, which initiates infection, was acquired by a bat coronavirus through recombination with a pangolin coronavirus. Spike protein sequences acquired through recombination underwent subsequent purifying selection and are believed to enable enhanced viral entry into human cells, likely contributing to infection efficiency.

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Eitan Israeli

Many of life's failures are people who did not realize how close they were to success when they gave up.
Thomas Alva Edison (1847–1931), American inventor and businessman; developed many devices in fields such as electric power generation, mass communication, sound recording, and motion pictures