Introduction

1

Khaled M. Emara, Shady Abdelghaffar Mahmoud, and Nicolas S. Piuzzi

In the vast world of healthcare, applications of telemedicine are not only limited to direct patient care and can also include laboratory and radiological assessment, education and training, research, administration, and other meetings. Modalities of telemedicine also abound, and include telephone communication, video conferences, live text-based chat, asynchronous consultations using email or other store-and-forward applications, and remote patient monitoring using connected devices [1–3].

With the emergence of the global COVID-19 pandemic and the social distancing policies required to control the spread of infection, telemedicine has nearly entirely transformed from a convenient option to necessity across many specialties almost overnight. Unfortunately, orthopedic injury and disease continue to cause significant morbidity and mortality even as the pandemic rages on, and the need for orthopedic care remains. In the midst of such a pandemic, telemedicine provides an exceptional set of tools for physicians to continue diagnosing, treating, and managing orthopedic conditions.

The recent substantial growth in the field of digital health facilitates the rise of telemedicine. With a wide variety of mobile health apps and mobile medical devices, patients are starting to monitor and track their own health. These tools enable patients to diagnose their own infections, monitor glucose levels, and measure blood pressure using simple medical devices in their own homes. These consumer digital health devices can thus reduce the need for patients to see their doctors face-to-face. Telemedicine also confers many other benefits to patients and physicians alike:

K. M. Emara (✉)
Department of Orthopedic Surgery, Ain Shams University, Cairo, Egypt

S. A. Mahmoud
Orthopedic Surgery, Ain Shams University, Cairo, Egypt

N. S. Piuzzi
Department of Orthopedic Surgery, Cleveland Clinic Foundation, Cleveland, OH, USA
e-mail: piuzzin@ccf.org

K. M. Emara, N. S. Piuzzi (eds.), *The Principles of Virtual Orthopedic Assessment*,
https://doi.org/10.1007/978-3-030-80402-2_1

greater access to physicians across the boundaries of space and time, increased patient comfort, increased data transmission security, lower costs. In addition, the increasing digitization of healthcare driven by telemedicine can fortify medical databases that may also offer benefits to potential research and quality improvement efforts [4, 5].

Although telemedicine has a great capacity to augment the traditional face-to-face healthcare model with the tools of modern digital technology, there remain many components of the face-to-face encounter that are difficult to reproduce using telemedicine. One of the greatest difficulties of the telemedicine encounter is the clinical examination, for which many diagnostically vital steps cannot be assessed without face-to-face interactions [1].

The orthopedic clinical examination is an essential factor in reaching an accurate diagnosis and providing the best management options. Although there are many elements that cannot be translated to a virtual setting, the ability to perform elements of this clinical examination virtually can provide a valuable option for evaluating and following up with orthopedic patients [6, 7]. In this book, we will begin by briefly describing the history of telemedicine and different tools that may improve virtual orthopedic assessment. We will then outline the most state-of-the-art techniques and approaches for integrating medical history and possible telemedicine examination, broken down by body region. These virtual examination techniques are not meant to replace face-to-face consultations, which will still be required when a telemedicine visit fails to reach a definitive diagnosis, when cases are complex, and as a final check immediately prior to an invasive diagnostic or therapeutic procedure. Nonetheless, the methods outlined in this book may provide a valuable addition to an orthopedic surgeon's arsenal when caring for a patient virtually.

References

1. Matusitz J, Breen GM. Telemedicine: its effects on health communication. Health Commun. 2007;21(1):73–83.
2. Wootton R, Craig J, Patterson V. Introduction to telemedicine. Boca Raton: CRC Press; 2017.
3. Conrad K. Making telehealth a viable component of our national health care system. Prof Psychol Res Pract. 1998;29(6):525.
4. Breen GM, Matusitz J. An evolutionary examination of telemedicine: a health and computer-mediated communication perspective. Soc Work Public Health. 2010;25(1):59–71.
5. Tuner JW, Thomas R, Reinsch NL. Willingness to try a new communication technology. J Bus Commun. 2004;41(1):5–26.
6. Daruwalla ZJ, Wong KL, Thambiah J. The application of telemedicine in orthopedic surgery in Singapore: a pilot study on a secure, mobile telehealth application and messaging platform. JMIR Mhealth Uhealth. 2014;2(2):e28.
7. Prada C, Izquierdo N, Traipe R, Figueroa C. Results of a new telemedicine strategy in traumatology and orthopedics. Telemed e-Health. 2020;26(5):665–70.