

CORR Insights®: How Satisfied Are Patients and Surgeons with Telemedicine in Orthopaedic Care During the COVID-19 Pandemic? A Systematic Review and Meta-analysis

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Where Are We Now?

Social distancing and busy orthopaedic clinics simply do not mix. The merger of these concepts, often pushed during coronavirus disease 2019 (COVID-19), created a perfect storm. The clinician must find the delicate balance between state laws, hospital guidelines, virus transmission, and practice efficiency.

This CORR Insights® is a commentary on the article "How Satisfied Are Patients and Surgeons with Telemedicine in Orthopaedic Care During the Coronavirus-19 Pandemic? A Systematic Review and Meta-analysis" by Chaudhry et al. available at: [10.1097/CORR.0000000000001494](https://doi.org/10.1097/CORR.0000000000001494).

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Telemedicine is an alternative approach to patient care. Many reports, commentaries, and editorials have sought to assist surgeons in how to use telemedicine during these unprecedented times [2, 14, 20]. This meta-analysis by Chaudhry et al. [5], therefore, comes at an apt time, as we have more data to evaluate satisfaction and patient-reported outcomes between traditional and telemedicine consultations.

Despite some of our colleagues engaging with telemedicine for the first time during this pandemic, the concept has been used in other medical specialties for at least 20 years with mixed results. A systematic review in 2010 found that although most reports found telemedicine useful and safe, there were limitations when treating more complex medical issues [8].

Regarding its cost-efficiency, one study [1] reported a 50% decrease in costs when seeing nonoperative patients via the telephone. Furthermore, the Center for Medicare & Medicaid Services will reimburse physicians for services rendered through telehealth at the same rate as in-person visits for all diagnoses, as well as allowing new visits to be performed remotely [4].

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In the current study, Chaudhry et al. [5] examined 12 articles (representing eight randomized controlled trials). It is reassuring to know that studies were performed in both North American centers and those from Europe, making conclusions more relevant on an international scale. The authors found that patients have equal levels of satisfaction, whether they were seen via telemedicine or traditional in-person means. In addition, their treating surgeons were likely to report similar levels of satisfaction. This report also found that no prominent differences exist in patient-reported outcome measures (PROMs) between telemedicine and in-person consultations. These PROMs covered generic function, disease-specific function, and pain.

These fascinating results must be interpreted cautiously as the scoring systems were neither validated nor consistent. There will be an inherent degree of bias of these positive outcomes too, by patients and surgeons who were enthusiastic to try this modern consultation means. Surgeons can use the findings in this meta-analysis to improve patient care by evaluating their individual practices and implementing telemedicine appropriately. This may be for non-operative cases, follow-up, or for monitoring patients who reside far from the hospital. Potential cost savings could

also indirectly improve patient care by providing more capital for resources.

Where Do We Need To Go?

While it is tempting to assume that telemedicine would produce a quicker face-to-face consultation, its time-efficiency has not been thoroughly evaluated. This present study shows that the time commitment is less for the patient with telemedicine, even when travel is excluded [5]. Telemedicine can have broader benefits in the fight against COVID-19, allowing people in the hospital, and indeed on public transport, to physically isolate more effectively. Additional benefits of telemedicine include less hours off work, less fuel consumption, and fewer lost opportunities, as previously corroborated by a randomized study [3]. It should be noted that this study, and others before it [10, 16], have not shown whether this perceived time saving is applicable to the surgeon. Many factors like telemedicine preparation and extra administrative duties will also need to be accounted for in future studies, in addition to purely assessing consultation time.

Satisfaction with the telemedicine process can be better defined. More-uniform measuring tools need to be utilized as well. At a minimum, these tools need to be validated in a similar fashion as the Consumer Assessment of Healthcare Providers and Systems [18]. One also must be aware that the possibility of measurement ceiling effects is high, further emphasizing the need for additional satisfaction outcome tools.

There is no value in being satisfied with a process if it is not safe for our patients. Further information is required pertaining to missed diagnoses or incorrect surgical advice being

given through telemedicine. Even a relatively small number of mistakes could radically negate the satisfaction of telemedicine. This information needs to be representative from the entire spectrum of orthopaedic subspecialties. To date, most of the encouraging literature has come from lower limb arthroplasty follow-up [15].

A crucial distinction that should be made is whether the patient is satisfied with the treatment, the interaction, or both. These two areas have been shown to overlap and be influenced by the other [9]. Previous studies to date have leaned toward patients reporting satisfaction with the telemedicine process rather than their surgical outcome, which has some inherent bias [17, 19]. Therefore, when reporting on treatment satisfaction, the consultation should be performed by a professional separate from the surgical team.

How Do We Get There?

It would be feasible to use telemedicine to collect outcome measures when assessing both preoperative and postoperative patients, which was recently done in a randomized controlled trial with favorable results [11].

Future comparative studies must be adequately powered to detect differences in complications, ensuring patient safety is not compromised with the use of telemedicine. Practically speaking, this will be difficult to implement as missed diagnoses would have to be picked up during an additional in-person visit; requiring two visits per encounter. This would reduce the efficiency and cost-effectiveness of the process. Furthermore, missed diagnoses are often difficult to spot and may be missed in-person too. One potential research idea would be to have a study where different surgeons are on

the same call with the patient. Then if one surgeon on that consultation makes a diagnosis that is missed by other surgeons, this could be evaluated and patterns determined.

We need to continue to ascertain the ideal method of examining patients through audiovisual channels. Indeed, Dent et al. [7] recently showed the accuracy of goniometers used via a telehealth platform when assessing elbow flexion and extension. There was a high agreement with clinical goniometry as they measured each measurement virtually and in-person [7]. Future studies would need the sample group to attend both a virtual and in-person consultation to measure differences with measurement of range of motion. These studies should embrace technology and use newer technology such as motion sensors in contemporary tablets or smartphones to validate their use [6]. These are readily available and affordable to most patients. Satisfaction tools must be standardized and robustly validated for both the treatment and interaction. Indeed, investigators must specifically ask the question: “How satisfied are you with your clinical outcome?” And then separately ask: “How satisfied are you with the process of telemedicine?”

Regarding consultation time, it would be useful to consider the ancillary time required to prepare a virtual clinic. Preloading of radiographs, assuring there is a secure telecommunication platform, and time spent calling patients who have poor connections, should also be accounted for in any future studies.

As inclusive surgeons, we must account for our patients who are not well-suited for telemedicine, perhaps including those who are visually impaired, physically disabled, or those who cannot afford an internet connection or device. While this has been evaluated in geographical areas with low incomes [12],

we must ensure this substantial part of our society is not further disadvantaged [13]. It would be refreshing to see more studies that included these groups in their analyses, which is feasible. I believe this would be easier to study in the trauma population as many healthcare systems offer free care in these emergency situations to patient of lower socioeconomic class. Healthcare professionals in orthopaedics will not only have to be educated in the technical advances of telemedicine, but also strive to get the full clinical picture from each consultation as we consider the safety of telemedicine.

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