

Research Article

The Impact of the COVID-19 Pandemic on Physicians' Perception of Digital Health in Orthopedics

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Digital health and technology have been growing in healthcare over the past 10 years as they have allowed for health systems to remotely deliver virtual care at scale. Despite this, providers and healthcare systems have traditionally viewed technology as an additional asset, or even a burden in some cases, rather than a necessity. Due to the impact of COVID-19 on in-person treatment options for millions of patients, a rapid adoption of telemedicine and virtual healthcare services has been seen across the country and the globe. A survey (Appendix A) was conducted that included respondents from all roles within leading healthcare organizations – from surgeons to nurses to administrators & more. By analyzing data from various healthcare personas, we aimed to paint a complete picture of the orthopedic healthcare industry. COVID-19 has challenged the healthcare system and physicians to reimagine the ways they have traditionally delivered care to patients.

While barriers to adoption exist – including reimbursement and operational efficiencies – the orthopedic community is on track to have virtual care and telemedicine as a new normal long after the pandemic has come to an end. Forward-thinking healthcare systems and physician groups that rise to the challenge and adapt to this change will continue to make strides in improving patient care and driving this forward momentum, wherein healthcare can be a true hybrid of virtual and in-person care that best suits the needs of all patients.

INTRODUCTION

Digital health and technology have been growing in healthcare over the past 10 years as they have allowed for health systems to remotely deliver virtual care at scale. Despite this, providers and healthcare systems have traditionally viewed technology as an additional asset, or even a [burden in some cases](#) (Phichitchaisopa and Naenna 2013), rather

than a necessity. Due to the impact of COVID-19 on in-person treatment options for millions of patients, a rapid adoption of telemedicine and virtual healthcare services has been seen across the country and the globe. It's estimated that in 2020 the telehealth market will grow exponentially, resulting in a year-over-year [increase of 64.3%](#) (Imaging Technology News 2020).

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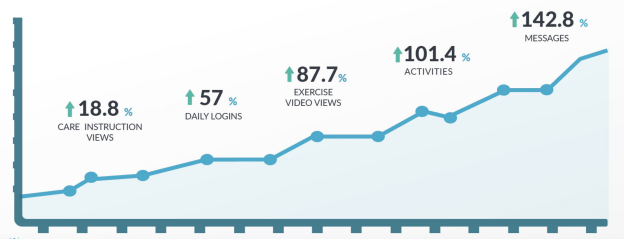


Figure 1: Patient Engagement Levels during peak COVID-19 in May 2020

Post onset of the pandemic, Force Therapeutics, a patient engagement platform centered around preoperative and postoperative education, exercises, and telemedicine, studied our database of over 200,000 patients and found that patients of all ages, backgrounds, procedures, and injuries are welcoming digital care. A recent analysis found that of all patients given access to the patient engagement platform, [only 2%](#) (“Virtual Physical Therapy in the Orthopedic Population: A Retrospective Analysis of 21,494 Patients” 2020) did not utilize virtual exercise prescriptions. At the peak of COVID-19, patients were increasingly engaged with the comprehensive virtual care platform across daily logins, care instruction and exercise video views, messaging and overall activities.

While data indicates that patients have adapted to this new normal, our aim was to determine various perceptions of technology in healthcare among providers of all roles in the orthopedic space prior to COVID-19 and in this new environment.

METHODS

Researchers conducted a survey (Appendix A) that included respondents from all roles within leading healthcare organizations - from surgeons to nurses to administrators & more. Respondents came from all backgrounds of technology. The purpose of analyzing data from various healthcare roles at different hospital systems (Ambulatory Surgery Centers, Academic Medical Centers, and Community Hospitals) was to aim to paint a complete picture of the orthopedic healthcare industry.

The survey gathered information from July 2020 through September 2020 on physician and care team members' utilization, thoughts, and suggestions on the way they engaged with technology prior to and during the COVID-19 pandemic. The survey was distributed through a google form to physicians and care team members both utilizing and not utilizing the patient engagement platform to minimize bias of those who have technology embedded in their day to day, and those who do not. Surveys were administered through email, and LinkedIn with role, organization, and email to validate responses. We then interviewed leading clinician voices with years in the space, as well as those newer to the field of medicine including residents, to dive deeper into what is working, what isn't, and what they want to see in the future.

KEY RESULTS

1. THE METHODS BY WHICH PHYSICIANS ARE COMMUNICATING WITH THEIR PATIENTS ARE SHIFTING

Prior to COVID-19, 75% of respondents reported in-person visits as their main method of patient communication. This was the most commonly utilized option, followed by phone calls, email, and communication through virtual care platforms.

During the spring peak of COVID-19, only 1 respondent reported still seeing patients in person, and respondents reported a large shift to telemedicine, virtual care platforms, and additional phone calls as their main methods of communication. This lack of ability to safely see patients in-person greatly shifted methods of communication towards a rapid adoption of telehealth, with 92% of respondents reporting utilizing telehealth during COVID-19.

“Over the past several months the proportion of visits that have turned into telehealth has in some days turned into close to 40% of your typical pre-COVID office day, which may be anywhere from 15-20 patients.” Dhanur Damodar, M.D. Jackson Memorial Hospital - Jackson Health System

Even now, as the country begins to reopen, and the majority of providers are able to see patients in person, some methods of communication that increased during COVID-19 have remained. With telemedicine and virtual care now offered at many offices, several patients have opted for this alternative, with respondents reporting an overall 14% decrease in in-person visits as one of their main methods of communication with patients.

2. PHYSICIANS' WORK TIME SPENT ON TECHNOLOGY HAS INCREASED

To initially answer this question, we again looked at our database to understand how physicians were interacting with the patient engagement platform. Physical Therapists and Medical Assistants spent the most time on the platform during the COVID-19 pandemic. As patients were unable to attend outpatient physical therapy clinics, and Medical Assistants became the first responders for many patient questions, a patient engagement technology platform can provide a secure and easy way to continue patient interaction. However, not every provider specialty increased their platform usage. With many research trials paused, and admin personnel focused on rules, regulations and hospital procedure, we saw a decrease in their time spent on the platform.

To understand time spent on technology as a whole (not just through our platform), we asked providers to report the amount of time they were spending on technologies prior to COVID-19 and in the present; respondents reported a **120%** increase in minutes spent per week on virtual care technologies.

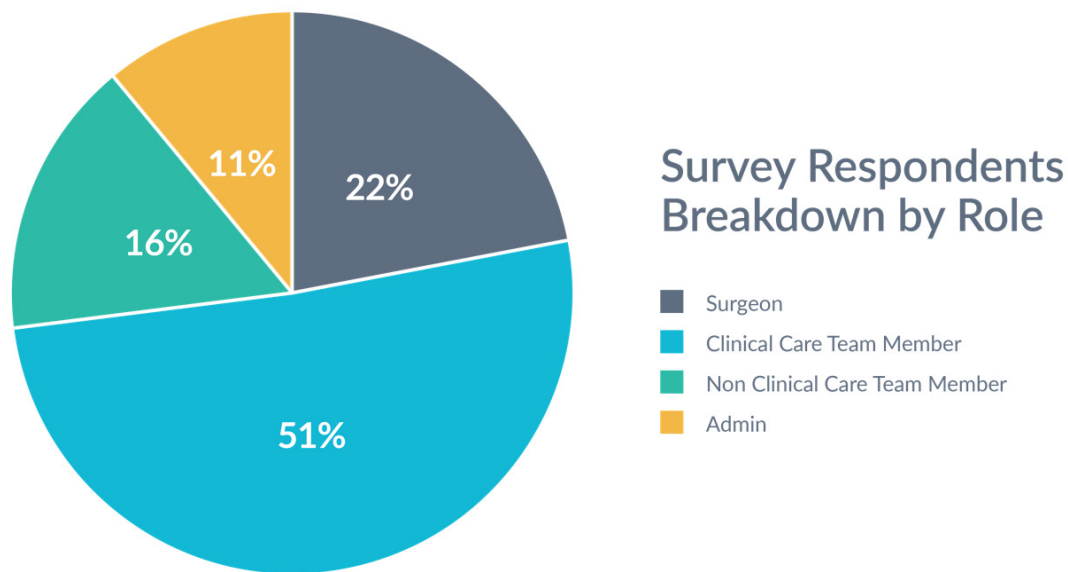


Figure 2: Survey Respondents breakdown by role (n=75)

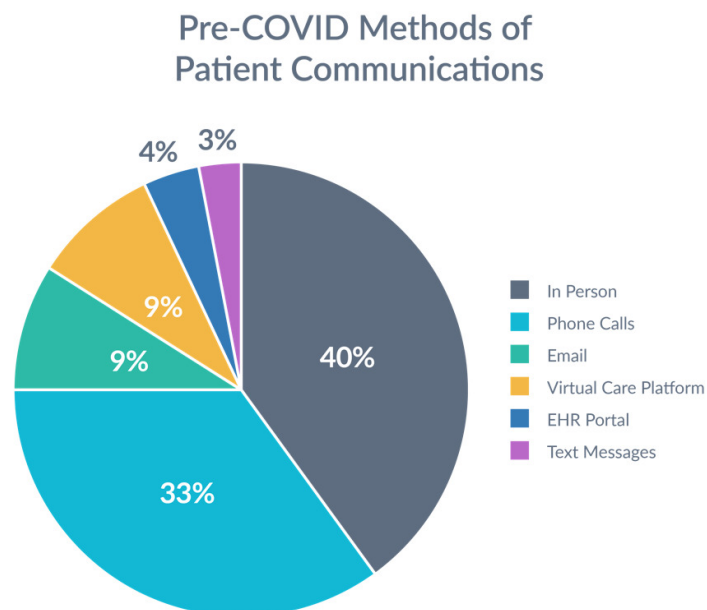


Figure 3: Physician-reported methods of patient communication prior to the onset of COVID-19 (n=75)

3. PHYSICIANS ARE OPEN TO VIRTUAL CARE AND BELIEVE IT HAS A FUTURE STRONGHOLD IN HEALTHCARE

Years ago, the initial shift from paper to electronic medical records was met with resistance from physicians and [health systems alike](#) (Dutta and Hwang 2020). Some top barriers to adoption included privacy and security concerns, reduced productivity, lack of reliability, and lack of usefulness. How-

ever, over time it became clear that electronic medical record (EMR) technology was here to stay, with 97% of hospitals nationwide using EMR data as of 2017, [compared to 87% in 2015](#) (EHRIntelligence 2019). As technology became far more widespread in all areas of life, EMRs continued to adapt to better meet the needs of health systems, physicians, and patients alike. Despite increased EMR and various technology capabilities, telemedicine was still not

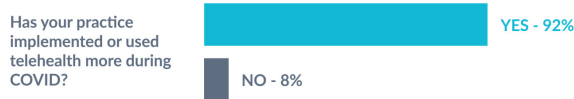


Figure 4: Physician-reported telehealth utilization during COVID-19 (n=75)

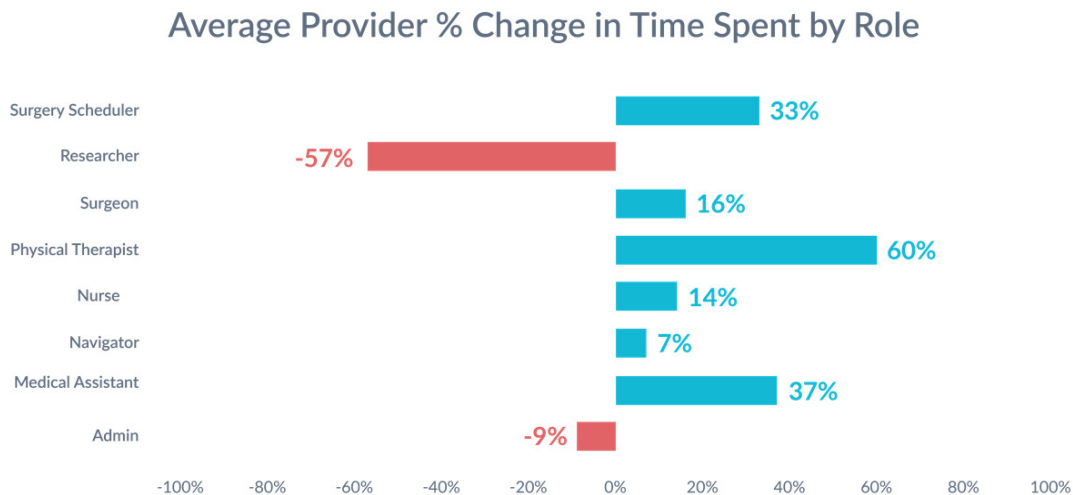


Figure 5: Percentage Change in Provider Time spent on Force Therapeutics by role prior to and during COVID-19

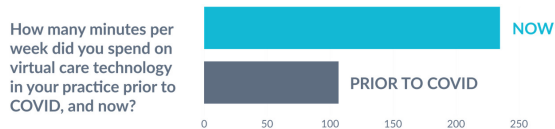


Figure 6: Physician-reported time spent on virtual care technology prior to COVID, and now (n=75)

widely adopted, and the majority of physician-patient interactions prior to the pandemic were handled in person.

Facing acute safety issues for seeing patients in person, many health systems had to rapidly deploy new services in order to connect with their patients and ensure successful recoveries. 83% of respondents reported that technology has indeed helped mitigate such challenges during COVID-19.

“With COVID came opportunity and challenge, and those organizations that stepped up to the challenge and adopted and changed their practices are the ones that fared better during the pandemic”

Paul Bruning, Chief Executive Officer at the Florida Spine Associates

Survey results indicate that, with an increase in telemedicine and virtual care technology utilization during COVID-19, providers were surprised at how willing and able patients were able to adapt to this new normal.

Dr. Kenneth Kress of Northside Hospital, reported “...most of those therapy programs shut down after 2 weeks because of the virus and the honest to god truth is that those patients are doing fantastic. They’re happier, they’re doing better, I’m seeing less wound complications.” While patients are continuing to recover post-operatively without compromised outcomes – and providers believe that technology has helped them mitigate challenges during COVID-19 – the larger question that remains is whether physicians believe that this momentum will continue. And, if so, do they want it to?

Results from survey respondents were mixed: only 1% of physicians believed that they would not continue to utilize telehealth after COVID-19, but 34% reported that it was a “maybe.”

After interviewing and surveying physicians and their care team members, we came to learn that the doubt surrounding the continuation of telehealth has less to do with

What has surprised you about patient engagement of technology during COVID?

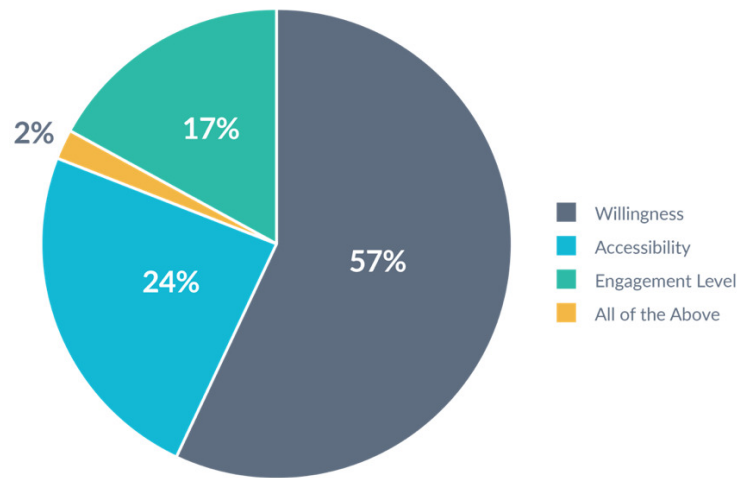


Figure 7: Physician-reported responses to question “What has surprised you about patient engagement of technology during COVID?” (n=75)

Will you continue to use telehealth in your practice after COVID?

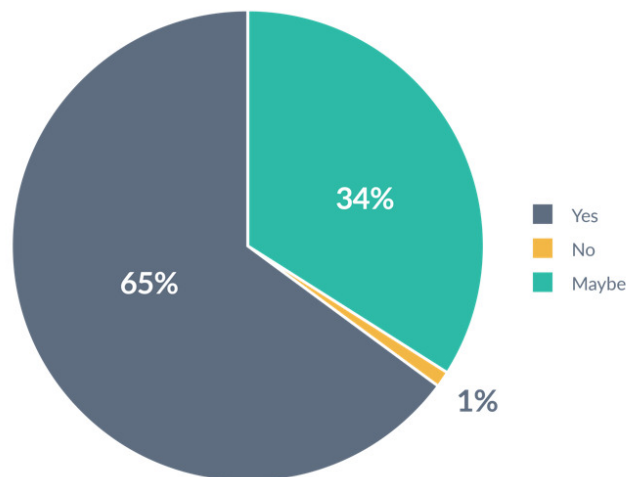


Figure 8: Physician-reported telehealth utilization after COVID-19 (n=75)

patient safety and provider adoption, and more to do with the uncertainty surrounding the continuation of emergency changes surrounding reimbursement and billing.

“A lot of us have realized that maybe these in-person visits are not necessary and maybe they take risk and time and cost patients money and inconvenience and so forth. And so I suspect that we’re going to have wider adoption of this and certainly

with the patient’s permission if you will, it’s something that we’ll do more often.” Gregory J Golladay, MD, VCU Health

DISCUSSION

BARRIERS TO ADOPTION: UNCERTAINTY SURROUNDING POLICY & REIMBURSEMENT

As the critical need for telemedicine and virtual care became apparent during the peak of COVID-19, both Center for Medicare and Medicaid Services (CMS) regulations, as well as state regulations, changed to increase reimbursement opportunities of virtual services. In March, Congress issued \$8.3 billion towards the coronavirus outbreak, \$50 million of which was allocated to waiving current telehealth restrictions. Another \$2 trillion was issued, with \$100 billion going to hospitals to provide more flexibility in reimbursement and longevity of their business post-pandemic; previously mandated restrictions were loosened to allow for more flexibility in managing patients in the midst of the outbreak. In order to continue to put patients first and provide necessary care during a time of crisis, providers were able to use any tools at their disposal - including FaceTime, Zoom and more - which previously violated HIPAA regulations.

Policymakers are continuously changing and adapting laws and regulations to the current climate need, but what does this mean when the pandemic is over? How will this affect long-term policy? The answer at the moment is unclear. With provider buy-in and patient satisfaction, telemedicine seems as though it should become a staple for the foreseeable future. However, without defined codes, practices lack the incentive to continue telemedicine visits in a sustainable and scalable way for their practice, and reimbursement may not be equal.

"I think there needs to be more done in terms of parity between states and payers... One payor may not pay anything for telemedicine and one payor may pay 150% what Medicare pays. There needs to be some consistency out there to develop the telemedicine market and allow access for everybody." Paul Bruning, Chief Executive Officer at the Florida Spine Associates

Other telemedicine limitations include lack of reimbursement across state lines, and lack of reimbursement for other specialties, such as physical therapy, and need to change workflows. Physicians, care team members, and health systems alike need to know now what telemedicine payment and virtual care technology reimbursement and regulations are going to look like in the post-pandemic world, and change their practices accordingly. If patient appointments within an episode of care are going to be virtual, provider workflows need to adjust accordingly to ensure that safety is still being met. For example, radiographic images to ensure proper fit and functional assessments to ensure patients are on the proper road to recovery need to be taken into account and thought through with this new workflow. As providers continue to utilize telemedicine while rules are lax, policy-makers are taking notice of potential cost savings and driving incentive forward to continue with value-based programs.

EMPOWERING PHYSICIANS AMID THE NEW NORMAL: HOW CAN VIRTUAL CARE TECHNOLOGY AND TELEMEDICINE HELP INFORM DECISION MAKING?

Virtual care technology [has proven](#) (Buchalter et al. 2020) to help patients perform better after surgery, reduce complications, and have better overall satisfaction. In the current pandemic, it is also the key to keeping patients safe and distanced.

"During the COVID pandemic, our goal for patient safety is to minimize contact with any of their providers in order to decrease the risk of pathogen spread. There is no better time to initiate digital health services such as Force Therapeutics to promote patient safety, improve patient independence, engage patients in their own recovery, and improve the patient care experience." - John Grady-Benson, MD, FAAOS, Physician-in-Chief, the Hartford HealthCare Bone & Joint Institute

While a provider's number one priority is the safety of their patients – any solution that can assist in that is valuable – it is important to delve into additional metrics that are important to physicians, care team members, and healthcare systems that technology and virtual care solutions can solve for. One increasingly common theme among physicians we interviewed is the collection and utilization of data in order to drive evidence-based care improvement. Virtual care technologies can collect data that is needed to drive improvements in areas such as Patient Personalization, Predictive Analytics, and Real-Time Dashboards.

Patient Personalization: Personalized care for each patient is key to achieving the best outcomes and experience with the fewest complications. Traditionally, personalized care was a very manual effort such as more in-person check ins, phone calls, and additional paper handouts. Virtual care technologies have the ability to scale full-time efforts by delivering highly-personalized, pre- & post-op care that adapts to each patient's recovery plan according to their unique needs, risk factors, and procedure type. By catering to a patient's individual needs, physicians can work towards reducing postoperative complications and reduce overall costs for the healthcare system.

Predictive Analytics: By leveraging historical patient data and analytics techniques to make predictions about future outcomes, physicians are able to get ahead of potential complications. Without a tool to collect this data, providers cannot easily understand how *all* their patients are recovering and what might need to change to see future improvements. For Dr. Robert Belniak at Connecticut Joint Replacement Institute at St. Francis, leveraging data and predictive models to help select and prepare his patients is top of mind.

"I think that Force and PROMs are part of a larger predictive analytics model ... You can give patients a better idea of how they are going to do postoperatively." Robert Belniak, MD; Connecticut Joint Replacement Institute at St. Francis

Real-Time Dashboards & Benchmarking: Not only is it important for physicians and care teams to collect data for research, patient personalization, and predictive analytics, but it is also important for physicians to be able to see all of that information in real time and deep-dive into the data. Virtual care technology that can enable providers to gain real-time insights into their overall outcomes and patient volumes is an area that Dr. Ira Kirshenbaum, the Chairman of Orthopaedics at BronxCare Health Systems, finds extremely valuable.

“It is so valuable to have timely dashboards that give physician leaders clinical and business intelligence to make decisions” Dr. Ira Kirshenbaum, the Chairman of Orthopaedics at BronxCare Health Systems

While it's valuable for physicians to see their own data, it's also important to be able to see pooled regional data - or other providers' data for similar patient, procedural, and socioeconomic backgrounds - in order to see where improvements may be made and to help negotiate bundles. With patients engaging with technology, this data is becoming increasingly possible and more accessible.

LIMITATIONS AND FUTURE RESEARCH

A limitation of this study is that the survey was sent to members Force Therapeutics have in our database of physicians and care team members over the years. The survey was inclusive of both providers that utilize and do not utilize the platform to minimize bias, however it is not a complete volume throughout the United States and many emails were out of date. Future research could have a larger sample size of all members of the orthopedic community.

An additional limitation is the need to study the future state. As vaccines begin distributions and there is opportunity to revert back to normal practice, a suggestion for fu-

ture research is to understand if this technology shift will remain, how compensation and reimbursement for technology continues and evolves, and how it impacts providers and patients alike.

THE FUTURE STATE OF DIGITAL HEALTH IN ORTHOPEDICS

COVID-19 has challenged the healthcare system and physicians to reimagine the ways they have traditionally delivered care to patients. While barriers to adoption exist - including reimbursement and operational efficiencies - the orthopedic community is on track to have virtual care and telemedicine as a new normal long after the pandemic has come to an end. Forward-thinking healthcare systems and physician groups that rise to the challenge and adapt to this change will continue to make strides in improving patient care and driving this forward momentum, wherein healthcare can be a true hybrid of virtual and in-person care that best suits the needs of all patients. Future research is needed to understand how technology will continue to be implemented, and best practices to ensure patient safety and accuracy of provider reimbursement.

THANKS

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SUPPLEMENTARY MATERIALS

Appendix A

Download: <https://journaloei.scholasticahq.com/article/21452-the-impact-of-the-covid-19-pandemic-on-physicians-perception-of-digital-health-in-orthopedics/attachment/55150.docx>
