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Research Article

One Year Analysis of Financial and Clinical impacts of COVID-19 on an Orthopedic Surgery Department, Analysis of Recovery Timeline and Assessment of Implemented Telehealth Initiatives

Chad Amato, MD[1a], Andrew Kantzos, MD[2b], Kristofer Matullo, MD[2c]

[1] Orthopedic Surgery, St. Luke's University Hospital, [2] Orthopedics, St. Luke's University Hospital

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Introduction

To evaluate the effects that pandemic restrictions had on our practice, evaluate initiatives to increase care options to patients, and assess the rate of return to normal operations.

Methods

Surgical volumes, clinic volumes, telehealth utilization, RVU generation, Fee for Service Charges (FFS) during the period of COVID-19 restrictions from mid-March 2020 through May 2020, were compared to data from the preceding months of the fiscal year as well as the months following the lifting of COVID restrictions.

Results

April 2020 saw the largest impact to each area compared to preceding averages of the fiscal year. Pre-COVID office visits averaged 2,256 per week compared to the COVID period average of 1,048 or 46% from baseline. Pre-COVID surgical cases averaged 169 per week, compared to 71 or 42%. Pre-COVID work RVU generation averaged 26,130 compared to April with 9,722 or 37% of baseline average. Pre-COVID FFS charges averaged $5,214,925 per month compared to April with charges of $1,753,992 or 33% of the pre-COVID average. Office visits, surgical cases, FFS charges, and RVU generation saw overall increases of 28%, 6%, 17.6%, and 15% respectively in the period following the lifting of restrictions.

a Dr. Amato is currently a fourth year Orthopedic Surgery resident at St. Luke's University Hospital in Bethlehem, PA. Originally from St. Clair, Michigan, Dr. Amato attended Michigan State University and Wayne State University, where he received his undergraduate and medical degrees, respectively.

Visit the Open Payments Data Page for Dr. Amato

Conflicts of Interest Statement for Dr. Amato

b Dr. Kantzos is currently a fourth year Orthopedic Surgery resident at St. Luke's University Health Network in Bethlehem, PA. He is interested in pursuing a fellowship in Orthopedic Oncology. He did is undergraduate training in Biomedical Engineering at Northwestern University. Originally from Chandler, AZ, Dr. Kantzos received his MD from University of Arizona, College of Medicine - Phoenix.

Connect with Dr. Kantzos on LinkedIn

Visit the Open Payments Data Page for Dr. Kantzos

Conflicts of Interest Statement for Dr. Kantzos

c Dr. Matullo is a board certified Orthopedic hand specialist. He provides comprehensive care for patients with diseases and injuries of the hand and elbow. He is also actively involved in reasearch surrounding advances in the treatment of hand issues.

Visit Dr. Matullo's Professional Practice Site

Visit the Open Payments Data Page for Dr. Matullo

Conflicts of Interest Statement for Dr. Matullo

Conclusion

The COVID-19 pandemic and the associated restrictions on elective case and clinic volumes have shown significant reductions in case volumes, clinic volumes, RVU, and FFS generation. Going forward this analysis may serve as a framework to estimate the impact from possible future restrictions on an orthopedic practice should a similar event take place in the future.

INTRODUCTION

The COVD-19 Pandemic has had a significant economic impact throughout the world, resulting in dramatic changes to businesses both large and small. This has resulted in mass layoffs, furloughs, and, in many instances, termination of staff members in the hopes of maintaining businesses long term (Fernandes 2020). The economic downturn has not spared the U.S. healthcare system, or more specifically, the field of orthopedic surgery (Barnett, Mehrotra, and Landon 2020). Resource allocation to facilitate the rapid influx of patients during this time has led to significant reductions in elective surgical procedures within many specialty fields. The goal became the preservation of necessary equipment, such as ventilators, personal protection equipment, and operating rooms capable to provide care to COVID positive patients, as critical care resources became increasingly scarce (Hanson et al. 2020). Overall, the most stringent of restrictions began to take effect in March 2020 and extended in our area through May 2020. The effects of COVID-19 have not been solely seen in the inpatient setting but in outpatient clinics as well. Additional measures were implemented in the clinical setting in order to reduce the risk of potential patient and provider COVID exposure. Of significant note is the drastically reduced number of in-person clinic appointments being offered in order to limit waiting room traffic and comply with social distancing mandates (Mehrotra 2020). While methods such as telemedicine have also been added to provide care to a greater number of patients during this period, the effect of this drastic decrease in clinic patients has remained significant (Hollander and Carr 2020).

The elective nature of many orthopedic conditions that are ultimately treated with surgical intervention has highlighted the financial impact that an abrupt cessation of elective surgeries and the accompanying clinical volumes can have on an orthopedic practice and hospital system as a whole. Our orthopedic network consists of 10 hospitals across eastern Pennsylvania and New Jersey with 25 orthopedic surgeons, 7 non-operative sports medicine physicians, and 21 physician assistants. The hospital network contains a Level 1 trauma center as well as a dedicated outpatient surgical center. Beginning the third week of March 2020, our institution began implementing COVID-19 restrictions. These included the cancellation of elective orthopedic surgical procedures and limiting in-person clinic visits to acute injury visits for patients seen in the emergency department/urgent care setting as well as post-operative visits to allow for wound evaluation and suture/staple removal as needed. When possible, the utilization of video and phone visits was made available for patients not meeting these criteria. Telemedicine had not previously been implemented to any significant degree in our practice prior to the COVID-19 pandemic. This has generally been the case for many orthopedic practices with limited evaluation of this technology in the field and those studies coming from primarily rural settings (Lese and Sraj 2019). Utilizing these alternative appointment methods has allowed our practice to evaluate the role that telemedicine has had on our orthopedic clinic during this pandemic on a larger scale, as well as evaluate metrics to assess the usefulness of telemedicine for implementation in the future. The purpose of this paper is to evaluate the impact that the COVID-19 pandemic and the associated restrictions have had on an orthopedic practice in terms of financial and clinical parameters, as well as to assess the response to countermeasures such as implementation of telehealth services in the office setting and to evaluate the early rate of return towards normal for these areas of our practice following the lifting of imposed restrictions. Though the COVID-19 pandemic is improving in many areas of the world, this event highlights the vulnerable nature of orthopedic practices should conditions force a practice to shutter elective procedures for any significant portion of time. Our aim is to provide an overview of how this pandemic has impacted our institution and provide insight that may aid orthopedic practices should future practice disruptions occur.

MATERIALS AND METHODS

In the U.S., nationwide measures to decrease resource utilization by reducing elective surgeries and clinic volumes took effect during the month of March of 2020 following recommendations by the Centers for Medicare and Medicaid Services, the Surgeon General, and the American College of Surgeons (CMS.gov 2020; American College of Surgeons 2020). Following these recommendations, extending from March 16th, 2020 through May 11th, 2020, our department operated under the previously described restrictions. This timeframe provides us with the most accurate assessment of the immediate financial impact of these measures. Data related to surgical volumes, clinic volumes for new and established patient visits, overall outpatient RVU generation, and fee for service charges (FFS) (given the inherent delay and variability in payment collection, this method was deemed a more accurate representation of financial impact versus collected final revenue) were evaluated with COVID restrictions and compared this to historical data from June 2019 forward. This allowed us to evaluate the impact of the time period of the most stringent restrictions and to assess the initial response in these metrics to the easing of restrictions, while comparing the data to pre-COVID values. Weekly and monthly data were assessed for the months of March, April, and May 2020 individually

and compared to the average pre-COVID months of June 2019-February 2020. These values were then compared to data from June 2020 following the lifting of restrictions through April 2021 for comparison following resumption of normal clinical and surgical practices.

RESULTS

Overall office visits for new and established patients during the pre-COVID period averaged 2,256 per week compared to the COVID period average of 1,048 or 46% of baseline clinic visits. Specifically, new patient visits per month during the pre-COVID period averaged 2,418. March, April and May saw total new patient visits of 1,869, 717, and 1199 corresponding to 77%, 30%, and 50% from the pre-COVID average, respectively. Recent office visits following resumption of normal clinic activities have averaged 2,653, an overall increase of 28% from baseline. Surgical cases during the pre-COVID period averaged 169 cases per week, compared to 71 cases or 42% from baseline average during the COVID period. Since the resumption of elective procedures, weekly cases have averaged 179, again an overall increase from baseline of 6%. Surgical case volumes returned to pre-COVID levels immediately following resumption of elective cases with June 2020 even surpassing pre-COVID average surgical case volumes at 199 per week. Monthly data was assessed for Fee for service charges as weekly data was not specifically recorded. Clinical work RVU generation in the pre-COVID period averaged 26,130 compared to March 2020 with 22,798 or 87% of the average. April saw RVU generation of 9,722 or 37% of baseline average, and May with RVU generation of 18,056 or 69% of the baseline average. Following resumption of elective cases and normal clinic operations, RVU generation has averaged 30,263 per month for an overall increase of 15% compared to baseline levels. For the month of April, which saw the most significant number of telehealth visits at 1,002, RVU generation consisted of 1% level 1, 12% level 2, 64% level 3, 21% level 4, and 0% level 5 billing, compared to pre COVID billing levels of in-person visits of 0% level 1, 3% level 2, 77% level 3, 22% level 4, and 1% level 5. Overall RVU generation from telehealth services during April 2020 per provider ranged from 1% to 26% of total generated RVU. Provider telehealth visit RVU generation for April 2020 represented 15% of the total visit RVU generation of combined in-person and telehealth services. FFS charges during the pre-COVID period averaged $ 5,214,925 per month compared to March 2020 which saw charges of $ 4,526,289 or 87% of the pre-COVID average. April saw charges of $ 1,753,992 or 33% of the pre-COVID average. Beginning the month of May when clinic restrictions were lifted, FFS charges averaged $ 6,135,775 or an increase of 17.6% compared to the pre-COVID baseline. Following resumption of normal clinic operations Telehealth visits averaged 53 visits per month a significant reduction when compared to COVID period visits

DISCUSSION

The COVID-19 pandemic has caused economic unrest in countless areas of the world economy, the U.S. health system, and the field of orthopedic surgery specifically was no exception. The elective nature of modern-day orthopedic surgery practices has placed them in a vulnerable position should events require this facet of the practice be shuttered for an extended period of time. Elective orthopedic procedures consisting of hip arthroplasty, knee arthroplasty, laminectomy, spinal fusion, and lower extremity fracture care account for 17% of all operating room procedures in the country (Agency for Healthcare Research and Quality, n.d.). Rapid cessation of these procedures as well as drastically reduced clinic volumes can be expected to have considerable impact on an orthopedic practice. Efforts to not only continue to offer clinical services to patients during this period but also offset the financial impact of the reduction of surgical and clinical volumes became paramount.

Certainly, reducing expenditures in the setting of drastically reduced billing and income generation became crucial. Unfortunately, temporary reductions in clinical staffing was an unavoidable area of cost reduction as diminished clinic volumes also reduced the number of practitioners needed to handle the daily patient volumes. Additionally, faculty members who are eligible for "paid time off" (PTO), were encouraged to utilize this time during the COVID period where production in terms of clinical and OR revenue generation were going to be reduced due to stringent regulations on both the operative and clinical areas. While this pandemic certainly demonstrated a unique form of business disruption and may not have been covered by existing insurance policies, one area for further assessment is the role that practice insurance policies could play to help offset some of the financial losses should this form of hardship be included in policy coverage in the future.

One of the most significant implementations during the COVID pandemic was the offering of telehealth visits either via telephone or video conferencing. As referenced earlier, telehealth initiatives have been relatively scarce in the field of orthopedic surgery. In our practice specifically, telehealth services were not a standard part of our practice prior to the pandemic. While telehealth visits cannot fully replicate the in-person visit or provide the practitioner the same level of detail as can be obtained with a physical exam, certain visit types were found to be quite amenable to this format. Specifically, post-operative visits for patients who had entered a period following suture/staple removal, no longer required X-ray images to be obtained such as with soft tissue procedures, and those who in previous appointments had demonstrated good results were deemed appropriate for this visit format. Additionally, patients with long standing issues such as osteoarthritis without any new trauma or change in symptoms were also deemed appropriate for this visit format to determine most likely next steps in treatment, such as further therapeutic injections or potential surgery once these types of in-person visits were once again permitted. As can be expected, the use of strictly telephone visits significantly limits the billing level

that can be assigned due to the lack of physical exam component, and consequently nearly all of the Level 1 billed visits in our data are attributable to telephone visits. In terms of new patient or "consult" visits, these visits were deemed appropriate for patients again who have chronic issues without acute trauma or patients who may have had relatively minor injuries with previous negative imaging obtained either at urgent care or emergency departments. Video visits allowed practitioners to have patients demonstrate the area of discomfort which was particularly more accurate in locations such as the knee or ankle where the area of pathology can be more closely pinpointed by patients. Our assessment demonstrates that from an RVU generation perspective, telehealth visits generate RVU at a rate identical to that of in-person visits on an individual visit basis. Correspondingly, in terms of overall billing trends, telemedicine visits tended to be billed at levels quite like in-person visits. Level 3 billing continued to be the most commonly billed level for both in-person and telehealth visits. Moderate increases in Level 2 billing were seen with telehealth visits that most commonly corresponded to follow up visits. This trend is likely due to more limited physical examinations given previous knowledge of the area of concern, difficulty to perform certain testing virtually, and an already limited differential diagnosis. Appropriately implemented telehealth visits offer the theoretical ability to provide additional appointment options to orthopedic patients in the future. Anecdotally, however, these visits can be challenging to implement effectively. For example, telehealth visits greatly limit the flexibility of the provider both immediately before and after this scheduled visit. The practitioner and patient must take time to log into the system, technical issues may arise for one party prolonging the time of the visit, and the patient must be seen on time regardless of the flow of the provider during the day. Correspondingly, what we observed is that this issue can many times be resolved with adopting schedule changes that group telehealth visits together at specific times in the clinic schedule to buffer the inherent disruptions that may occur within a typical orthopedic clinic day. Overall, we observed that, when offered, patients have maintained a desire to utilize the telehealth option, but to a much smaller extent when given the opportunity for in-person visits. In our opinion, telehealth visits do offer a sustainable option to increase access options to patients if the above concerns are addressed, mainly organizing a schedule to accommodate for potential technical difficulties so as to not negatively impact the clinic flow of face-to-face patient visits.

Not only has this evaluation allowed us to assess the downturn that this global event has had on our orthopedic practice, it has also allowed us to evaluate the rate of return to normal operational status. One question early in the pandemic postponement of elective surgeries was, how would patients respond when elective surgeries were permitted again? Would they proceed with rescheduling their surgery as soon as possible once restrictions were lifted, or wait a prolonged period before rescheduling? Our data trends indicate an interest from patients to have their procedures performed in an expeditious manner. Within a short period, our surgical case numbers reached pre-COVID levels and eventually surpassed them. Clinic volumes have correspondingly rebounded quickly as well, again surpassing pre-COVID levels. Additionally, we have seen a dramatic positive increase in FFS charges as well as RVU generation corresponding to the parallel increases in the above metrics.

In terms of generation of office visits, surgical volumes, RVUs and FFS billing during the pandemic restricted period, our health system was able to continue providing care to acute traumatic injuries and patients. As a health system with multiple level trauma centers, we continued to see injuries of necessity that required acute or subacute intervention to prevent long term disability or significantly increased morbidity. In this manner, revenue was able to be collected during this time and the authors recognize that the data is not able to be extrapolated to orthopedic practices without large trauma populations.

Moving forward, as conditions surrounding the COVID-19 pandemic continue to evolve rapidly with the ever-increasing prevalence of more severe virus variants, the potential for future practice disruptions remains a threat. This event highlights the vulnerable nature of orthopedic practices should conditions force a shutdown of elective procedures for any significant portion of time. This evaluation serves as a marker as to what an orthopedic surgery practice may expect to experience in terms of business and clinical disruption should future restrictions be imposed, as well as an assessment of the rate of return to normal operations when said restrictions are lifted. Lastly, telehealth initiatives were a relative rarity in the field of orthopedics prior to the COVID-19 pandemic, our experience highlights that with proper implementation telehealth initiatives can provide a useful adjunct to clinic workflows within an orthopedic practice.

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CONFLICTS OF INTEREST

None of the listed authors have any conflicts to disclose related to the above manuscript.

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