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Financial implications of telemedicine visits in an academic endocrine surgery program

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ABSTRACT

Background: Telemedicine is an emerging medium for the delivery of ambulatory care, but the reimbursement profile of telemedicine visits in the surgical setting has not been well studied.
Methods: A retrospective assessment of telemedicine encounters for thyroid and parathyroid conditions occurring from April 2015 to April 2017 was performed. Financial reimbursement from commercial payers for new and established patient visits were compared between telemedicine visits and in-person visits. Patient "savings" in terms of travel distance and drive time were calculated.
Results: A total of 290 telemedicine encounters were conducted; 7% were initial consultations, 47% were postoperative visits, and 45% were follow-up visits. The median patient age was 57 years. The median round-trip travel distance saved was 123.6 miles with estimated drive time of 2.4 hours per encounter. In 2% of cases, a second in-person visit within the 90-day global period occurred after a postoperative telemedicine encounter. Charges were filed for 67 encounters. The initial unpaid claims rate was 6%, which was consistent with the unpaid claims rate for in-person visits. The charge-to-collection ratio was comparable to that of in-person visits. There was a higher ratio of level 2 visits in the telemedicine encounters. Over the study period, 70 clinic hours were liberated via the use of telemedicine.
Conclusion: Endocrine surgery telemedicine visits have the same level for level reimbursement profile as in-person visits. Down-coding and elimination of components of in-office physical examinations may lead to modest decreases in overall reimbursement. Other advantages include reallocation of clinic resources and decreased travel burden for patients.

Introduction

The current standard of care in surgical practice often involves a preoperative consultation, a postoperative visit, and ongoing established visits for certain conditions at risk of recurrence. With this model, a number of burdens are placed on both the patient and the ambulatory clinic. The patient incurs travel time, missed work, lost wages, and transportation costs. The clinic incurs staffing costs as well as the opportunity cost of potentially accommodating new patients. Telemedicine is a rapidly evolving medium for the delivery of care that does not necessitate an in-person visit. Telemedicine is associated with improvements to access to care and operational efficiency.[1,2] Before the implementation of a telemedicine program, however, issues regarding patient privacy, financial reimbursement, and technological platform reliability must be addressed.

Previous studies have demonstrated the feasibility of telemedicine in a wide variety of practices, ranging from screening for diabetic retinopathy to postoperative visits for pediatric urology.[3,4] Surgical procedures, such as inguinal or umbilical hernia repair, have been found to be particularly suitable for postoperative telemedicine encounters because these operations are associated with relatively few complications that would require an in-person assessment or intervention.[5] Similarly, patients who undergo thyroid and parathyroid surgery may represent an ideal population for telemedicine because postoperative care involves wound inspection, discussion of pathology results, and voice evaluation.[6–8]

Given the evolving state of telemedicine and its potential for workload reduction for both the patient and provider, the application of telemedicine is rapidly growing. In this study, we document the financial implication of telemedicine in an academic

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endocrine surgery center as a routine component of patient care. We assessed financial impact on the ambulatory clinic, reductions in patient travel burden, and improvements in clinic access.

Methods

This project was approved by the University of California at Los Angeles (UCLA) institutional review board.

All patients from April 2015 to April 2017 who received a telemedicine encounter in the UCLA endocrine surgery section for a thyroid or parathyroid condition were included in the study. Telemedicine capabilities were available to all surgeons within the section. General guidelines for offering telemedicine postoperative visits were straightforward surgeries without concern for recurrent laryngeal nerve damage, seroma, or hematoma formation. It was at the surgeon's discretion whether to offer the patient an in-person or telemedicine visit. Telemedicine visits were completed on a HIPAA-compliant, secure web channel. During the study period, Cisco WebEx and Zoom Video Communications software systems were used for the first and second years of telemedicine visits, respectively.

Age, sex, patient zip code, postoperative complications, and operation type were extracted from the electronic medical record. Patients were stratified into 3 telemedicine visit groups: initial consultations, postoperative visits (defined as within 90 days after surgery), and established patient follow-up visits. In the postoperative visits, wound healing, voice function, and pathology were assessed and discussed with the patient. In the event of any signs of infection, unexpected pathology, or abnormal voice function, the patient was scheduled for an in-person visit after the telemedicine encounter. Established patient follow-up visits were used to provide additional counseling after initial consultation or to assess clinical progress 3 to 4 months after surgery.

Financial charges, collections, and denials were extracted from the practice management component of the electronic medical record for both in-person and telemedicine visits. Because of concerns from the institution about publishing charge-master and reimbursement rates, charge-to-collection ratios were calculated. Medicare patients were excluded from the financial portion of the study because of inability of our practice management software to determine whether the patient met location criteria for telemedicine reimbursement under Medicare rules at the time of the study.

Distance and travel time calculations were completed using Google Maps, assuming patients were driving during Monday morning clinic hours. These calculations were based on the patients' home zip code to the UCLA endocrine surgery clinic.

Results

Financial profile of telemedicine visits

Charges were filed for 67 encounters, and the initial unpaid claims rate was 6% (4 claims). The financial reimbursement was comparable to that of in-person visits for commercial payers when evaluation and management codes at the same level were analyzed. The total observed charge-to-collection ratio for all telemedicine encounters was 2.91 (Table 1). A total of 2 initial telemedicine visits were charged, yielding a charge-to-collection ratio of 2.63. Similarly, 58 established telemedicine visits were charged, with a charge-to-collection ratio of 2.93. Although 5 postoperative telemedicine visits were coded with a charge, they did not yield any financial reimbursement as these visits were bundled with the fee of surgery.

A typical in-person visit yields a charge-to-collection ratio of 2.5 regardless of encounter type. The percent of reimbursement captured (in-person/telemedicine charge-to-collection ratios) for initial and established visits were 95% and 85%, respectively.

All telemedicine encounters for both new and established visit types were coded as level 2 visits. For in-person visits, 75.9% of established visits were coded as level 2 and 24.1% were coded as level 3, 50.1% of new patient visits were coded as level 3, and 49.9% of visits were coded as level 4.

Clinic hours liberated

During the study period, 70 clinic hours were liberated by use of telemedicine. These extra hours were used to schedule additional in-person clinic visits. A standard in-person clinic visit takes approximately 30 minutes for new patients and 15 minutes for established patients. The extra 70 clinic hours saved from utilizing telemedicine translates to approximately 140 new patient visits or 280 established patient visits. There was no impact on improving physician capacity to see more patients.

Patient population and acceptance of telemedicine

A total of 290 telemedicine encounters were conducted over a 24-month period. Of these, 21 encounters (7.2%) were initial consultations, 137 encounters (47.2%) were postoperative visits, and 132 encounters (45.5%) were established patient follow-up visits (Table 2). This accounted for 1.3% of all new consultations, 12.7% of all established visits, and 14.1% of all postoperative visits during this time. The median patient age was 57 years, with a range and interquartile range of 14 to 83 years and 44 to 66 years, respectively. During the same period of time, 1,581 new patient visits, 828 established patient visits, and 888 postoperative visits were conducted.

The patient group consisted of 215 women (74.1%) and 75 men (25.9%). There were 124 patients (42.8%) managed for a thyroid condition, 160 patients (55.2%) for a parathyroid condition, and 6 patients (2.1%) for both thyroid and parathyroid conditions.

In 134 of the 137 patients (98%) who elected for a postop telemedicine encounter, no further in-person encounters were needed. Out of the 3 patients who required an additional in-person visit, 2 patients had an in-person visit because of a scheduling error. The last patient had an in-person visit to receive a laryngeal ultrasound due to dissatisfaction with voice recovery.

Travel distance and time saved

The median round-trip travel distance saved, as calculated from the patients' home zip codes to the UCLA Endocrine Center, was 124 miles (Fig. 1). The median round-trip travel time calculated during Monday clinic hours was 2.4 hours. The geographical distribution of patients who had a telemedicine encounter is also shown (Fig. 2).

Discussion

As a referral center in Southern California, we treat many patients who live outside the immediate metropolitan area. Even for residents of Los Angeles County, traveling short distances can still take a significant amount of time because of traffic congestion. This prompted our academic endocrine surgery practice to integrate telemedicine as a routine component of clinical care. Patients were still able to schedule in-person visits if they preferred. Telemedicine increased clinic availability for our practice, allowing more patients to be seen, led to improved efficiency in our clinic, and reduced travel burden for patients.

Serious postoperative complication rates for thyroidectomy and parathyroidectomy are low, making these patients ideal candidates

Table 1
Financial reimbursement profiles for telemedicine and expected in-person encounters (excluding unpaid claims).

Financial reimbursement	Initial	Postoperative	Follow-up	All patients*
Telemedicine visit				
Number of charges (*n*)	2	5	56	63
Charge-to-collection ratio	2.63	–	2.93	2.91
In-person visit (expected)				
Charge to Collection Ratio	2.5	–	2.5	2.5
Charge-to-collection (in-person/telemedicine)	0.95	–	0.85	0.86

* All patients excludes unpaid claims (4).

Table 2
Demographic characteristics of patients who had a telemedicine encounter for a thyroid or parathyroid condition between April 2015 and April 2017.

	Initial (21)	Postoperative (137)	Follow-up (132)	All patients (290)
Age (y), median (IQR)	61 (47,67)	57 (45,67)	56.5 (41.8,65)	57 (44,66)
Sex, *n* (%)				
Female	15 (71.4%)	95 (69.3%)	105 (79.5%)	215 (74.1%)
Male	6 (28.6%)	42 (30.7%)	27 (20.5%)	75 (25.9%)
Condition type, *n* (%)				
Thyroid	4 (19.0%)	48 (35.0%)	72 (54.5%)	124 (42.8%)
Parathyroid	16 (76.2%)	86 (62.8%)	58 (43.9%)	160 (55.2%)
Both thyroid/parathyroid	1 (4.8%)	3 (2.2%)	2 (1.5%)	6 (2.1%)
Round-trip distance saved (miles), median	711.1	158.1	95.9	123.6
Round-rip driving time saved (minutes), median	644	184	126	146

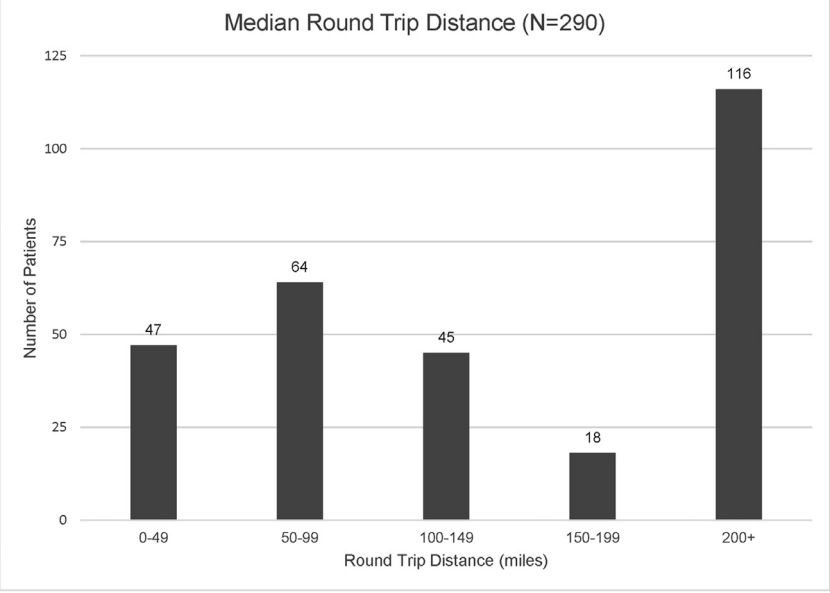

Fig. 1. Median roundtrip distance from patient home zip code to UCLA Endocrine Surgery Clinic zip code.

for telemedicine.[7,9] Our low rate of in-person appointments after telemedicine encounters demonstrated that a single telemedicine visit was adequate for routine postoperative care, obviating the need for an in-person visit.

Over the course of the study, we implemented 2 different telemedicine platforms and, in the near future, we will again be migrating to a third platform, which is fully integrated with our electronic medical records. During the periods of transition, there were a few technical failures. During these failures, the patient had a telephone conversation with the physician and sent a picture of their incision via a secure portal. This raises the possibility of foregoing the simultaneous video component of the telemedicine. In thyroid and parathyroid surgery, assessment of voice quality is important, therefore, the video or audio component of telemedicine remains essential. However, in other low-risk ambulatory surgeries, future iterations of telemedicine may simply include a chat dialog and a photo of the incision exchanged via a secured patient portal.

Although all 4 endocrine surgeons at UCLA were given the ability to conduct telemedicine visits during the study period, only 1 surgeon routinely implemented it and instructed the scheduling desk to routinely offer it to his patients. In this study, over 99% of the telemedicine visits were conducted by 1 surgeon. Future studies are needed to address barriers to greater adoption of telemedicine and to evaluate effectiveness of telemedicine implementation across divisions and departments.

A small fraction of telemedicine encounters in our study were initial patient consultations. Up until May 2017, telemedicine usage was restricted to established patients and could not be used for initial encounters in several states. During the period of this study, telemedicine visits for initial encounters did not always replace

Fig. 2. Geographical distribution of patients who had a telemedicine encounter (not pictured: Alaska, China, Hawaii, Guam, and United Kingdom).

in-person preoperative visits. One limitation that prevented the practice from conducting more extensive consultation via telemedicine is the requirement for physician licensure in each state where the patient receives telemedicine services. For out-of-state patients, these initial telemedicine encounters were used to provide general advice and determine whether an in-person consultation was necessary and therefore no charges were filed.

Financially, we found that the reimbursement profile for telemedicine encounters was comparable to in-person visits for in-state commercial insurers, with a similar rate of initial unpaid claims. Previous studies have found that a majority of health providers who receive private payer reimbursements report no differences in reimbursement between in-person visits and telemedicine visits with private payer insurance.[10,11] However, reimbursement rates are heavily influenced by state policy. At present, only 34 US states, including California, have telemedicine parity laws, mandating commercial insurance companies to reimburse services for telemedicine visits.[12] However, because these policies are actively evolving, more US states and commercial insurers will ultimately provide reimbursement for telemedicine services, broadening the use of telemedicine for outpatient encounters. At the time of our study, Medicare only reimbursed telemedicine visits for patients from rural or healthcare shortage areas.[13] We did not have an easily automated mechanism within our practice management software that could determine which patients were from these designated coverage areas. Therefore, we chose not to seek reimbursement from Medicare patients during this study period.

Although the reimbursement profiles for telemedicine encounters were comparable to in-person visits with evaluation and management codes at the same level, we observed “down-coding” for a subset of telemedicine visits, as we were unable to perform a detailed physical exam without an in-person encounter. Similarly, we routinely perform in-office ultrasound for thyroid cancer surveillance as part of established patient care, whereas patients undergoing telemedicine visits have their surveillance studies done outside of our office. This potentially leads to loss of revenue from ancillary services, such as laboratory and radiology, which were not quantified in our study. Lastly, we were unable to determine whether the availability of initial telemedicine visits allowed us to increase market share and accrue patients who may have elected to have surgical services performed closer to their homes.

In conclusion, telemedicine visits for endocrine surgery patients had similar reimbursement profiles from commercial insurers. In addition, we observed advantages of increased clinic availability and decreased travel time for patients. Implementation of telemedicine in surgical practices across the United States for a subset of low-risk procedures should be further explored, and the impact on market share and ancillary services revenue should be quantified.

Conflicts of interest

The authors have indicated that they have no conflicts of interest regarding the content of this article.

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