

Access to Consultative Dermatologic Care via Physician-to-Physician Asynchronous Outpatient Teledermatology

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Telemedicine has been incorporated into a wide range of specialties, including teleradiology, teleneurosurgery, telepsychiatry, and teledermatology.¹ The invention of digital imaging, the internet, and email facilitated the development of an asynchronous store-and-forward (SAF) technique in which high-resolution images could be shared simultaneously between physicians or from patients to physicians.²

In this retrospective study, we evaluated whether the University of Pittsburgh Medical Center (UPMC) Dermatology outpatient physician-to-physician SAF (OP2PSAF) teledermatology service allowed for a rapid portal for patient access to consultative dermatologic care and decreased primary care physician referrals to dermatology within a large health system.

METHODS

Inclusion Criteria

With University of Pittsburgh Institutional Review Board (IRB) approval, we reviewed teledermatology encounters between August 4, 2013, and December 12, 2019, with each date representing the documented day of the consult submission. All consults were from UPMC outpatient primary care providers (PCPs) practicing at multiple UPMC outpatient clinic locations ranging up to a 127-mile radius from Pittsburgh, Pennsylvania, to Erie, Pennsylvania. A designated teledermatology nurse at the UPMC North Hills Dermatology Teledermatology Clinic recorded all consults between these dates on the date of consultation. A rotation of 3 UPMC teledermatologists (all academic board-certified dermatologists) was assigned daily to cover incoming consults while continuing live patient encounters. Consults submitted between the clinic hours, from 8:00 AM to 4:30 PM, were responded to on the day of submission, whereas consults submitted after 4:30 PM were responded to at the beginning of the next duty day. Consults were sent electronically through the UPMC Health System Epic electronic health record (EHR). PCPs would route a specific Epic encounter, called a telemedicine encounter, with required information including location, duration, severity, previous treatments, and pertinent past medical history. Digital images simultaneously were uploaded into

ABSTRACT

OBJECTIVES: To determine whether physician-to-physician outpatient asynchronous store-and-forward teledermatology can be a portal for patient access to consultative dermatologic care and decrease primary care physician referrals to dermatology.

STUDY DESIGN: Retrospective study.

METHODS: Reviewed outpatient teledermatology consults completed within a shared Epic electronic health record at the University of Pittsburgh Medical Center (UPMC) Health System between August 4, 2013, and December 19, 2019. Study data were reviewed for consult response time and triage percentage. Patient and physician experiences were collected by satisfaction surveys.

RESULTS: This study reviewed 1581 teledermatology consults that originated from UPMC primary care provider (PCP) appointments. The average response time for a completed consult was 1 hour, 13 minutes for same-day consult submissions. The majority of consults, 63%, were completed online, whereas only 37% of patients were recommended for an in-person referral visit to the dermatology clinic. Surveyed patients (81%) and PCPs (90%) responded positively to their teledermatology experience.

CONCLUSIONS: Physician-to-physician outpatient asynchronous teledermatology consults can provide a model for rapid consultation and decreased primary care referral to dermatology.

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the Epic media section sandwiched between images of patient data (name, medical record number, date of birth). The PCP would then route the encounter to our specific teledermatology pool. The UPMC teledermatologists and nurse were notified automatically via email when consults were submitted. They would review the given history, digital images, and any pertinent history available in the specific patient EHR. The Epic telemedicine consult was amended with their impression, differential diagnosis, relevant comments, and recommendations and then routed back to the PCP.

Exclusion Criteria

Consults were excluded if they were submitted in error, digital images were not attached to the consult, or the patient's chart was inaccessible in UPMC Epic system. Patients were not excluded for any demographic reason.

Data Collection and Analysis

In accordance with the IRB, we collected the following predetermined data points from each consult: (1) consult submission to response time, (2) patient demographics, (3) primary reason for visit to PCP, and (4) triage recommendations. Data points were stored in a deidentified spreadsheet for future analysis.

Patient and Provider Surveys

Patient satisfaction was obtained through electronic surveys developed via the Qualtrics survey website. Surveys were designed to elicit understanding of the teledermatology experience. Provider satisfaction also was acquired via survey. Only providers who submitted teledermatology consults were provided electronic surveys regarding their experience. The survey included questions reviewed and approved by the University of Pittsburgh's Quality Improvement Committee/Review Board. Responses to the survey were based on agree/disagree questions with a 5-point scale. Any questions that were not answered by physicians or patients were left blank and therefore excluded when calculating percentages.

RESULTS

A total of 1625 consults were submitted, of which 44 cases were excluded. The remaining 1581 OP2PSAF teledermatology consults were analyzed. Patients' age range was 1 month to 99 years, with a mean age of 49.1 years. Female patients received teledermatology consults more often than male patients in every age group, with the exception of the subgroup aged 0 to 10 years.

We found that the majority of patients presented with a dermatologic chief complaint as their reason for the PCP visit—specifically, 61% (968/1581)—whereas 18% (284/1581) presented for an annual physical exam; 15% (234/1581), for a routine follow-up of a specific comorbidity; and 6% (95/1581), for a nondermatologic acute condition.

We noted that 84% of requested consultation encounters received responses within the same day, whereas 16% of encounters (those that were submitted after the 4:30 PM clinic hours) were responded

to the following day. The average consult submission time to encounter response for same-day consults was 1 hour, 13 minutes, indicating that patients received their dermatology consult in a rapid and timely fashion, at times while they were still in the PCP's office. Consults received after clinic hours were completed in an average of 16 hours, 37 minutes.

In 63% (989/1581) of cases, patients did not require a referral to our dermatology clinics and were given the teledermatologist's diagnosis and management recommendations directly from the referring PCPs. All PCPs could reconsult the teledermatologists as needed if the condition did not improve. In 37% (592/1581) of consults, patients were recommended to follow up with a dermatologist in person because they required further work-up for a more definitive diagnosis, a skin biopsy (if PCPs could not perform), or more complex treatments. Within the 592 patients who were recommended to have additional dermatologic work-up, 40% (239/592) of patients required an in-person consult for a more definitive diagnosis or treatment decisions, 40% (234/592) required a biopsy, and 20% (119/592) failed to follow up as recommended.

Patient satisfaction results were compiled from the online survey. We randomly selected 76 patients of the initial 280 consults to receive surveys, of which a total of 33 surveys were returned, with some not completing all questions. Overall, 25 of 31 (81%) patients agreed that they were satisfied with the way their skin was evaluated and treated. Most patients, 28 of 31 (90%), reported no problem with having a picture taken, and 28 of 33 (85%) had no problem waiting longer at their clinic visit. Most patients (25/30 [83%]) had no or small concerns about not directly talking to the dermatologist. Patients agreed/strongly agreed (21/31 [68%]) that their primary care doctor explained their skin problem sufficiently, whereas 8 of 31 (26%) felt neutral and only 2 of 31 (6%) felt that the doctor did not fully explain their skin problem. Patients agreed (24/31 [77%]) that they liked being able to have skin issues answered without another appointment. Only 7 of 31 (22.5%) patients would choose to make a separate appointment in the future with the dermatologist.

We surveyed 33 physicians who submitted the initial 280 electronic consults, and 22 completed the request. Overall, 20 of 22 (91%) of referring physicians rated their overall satisfaction with the teledermatology service as "high" or "very high," and 2 rated it as "neutral." All responding physicians reported that they were attending level. All 22 (100%) agreed that teledermatology affords increased access. Most (20/22 [90%]) responded that they would have made more referrals to dermatology if the teledermatology service did not exist. All 22 (100%) agreed that teledermatology increases quality of care for patients, reported that they were likely to use the service again, and responded that they would recommend the service to colleagues.

DISCUSSION

OP2PSAF teledermatology is appealing as a mechanism for improving patient access and decreasing PCP referrals to dermatology clinics.

Teledermatology has been found to be cost-effective for both the health care system and individual patients because it reduces face-to-face dermatology costs when conditions could be successfully managed by PCPs with teledermatology guidance and decreases out-of-pocket and travel expenses for patients.^{2,3} The overall dermatologist density is just 3.65 per 100,000 people in the United States.⁴ National average wait times for in-person visits have been found to be approximately 35 days and in Pennsylvania (our area of study) were estimated to be 20 days.⁵ Our study notes a rapid response with a 63% reduction in consults to the dermatology clinic and is similar to a study performed at University of Texas Southwestern, which noted a 63.5% decrease.⁶

Within our model at the UPMC Health system, physician-to-physician teledermatology consults are submitted using the SAF telecommunication system, through which consult information is submitted by the referring physician, stored, and made accessible to the consulting teledermatologist through an established Health Insurance Portability and Accountability Act–compliant Epic EHR telemedicine encounter. Images are uploaded and stored behind system firewalls for patient security/privacy. In addition to the specific submitted information, the consulting teledermatologist had access to all aspects of the patient EHR, including previous encounters, imaging, medications, and laboratory data. Our system followed recommended practices of appropriate disclosure, proof of identity, and access to medical history, as well as evidence-based treatment recommendations, including developing relationships with the PCPs and quality assurance.⁷

OP2PSAF teledermatology provides expedited dermatology care by providing therapeutic recommendations to patients faster than through traditional clinical access. The UPMC OP2PSAF teledermatology program offered either a same-day response or a next-day response in the event that consults were submitted after clinic hours, with average response times of about 1 or 16 hours, respectively, compared with the average wait time of 20 days (480 hours) for in-person clinic visits in Pennsylvania. UPMC Dermatology teledermatology physician-to-physician consultation is integrated into the live patient clinic workflow, resulting in rapid response time with minimal disruption to the dermatologists' clinical operations. Importantly, the UPMC Epic system is shared between UPMC dermatology providers and PCPs, facilitating rapid online communication. It also includes an online messaging system that enables patients to receive the teledermatologist's recommendations later in the day if recommendations came after they left the PCP appointment. PCPs readily maintained continuity of care by notifying their patients, prescribing therapies, and monitoring results in follow-up.

Subjective survey data showed both patient and provider overall satisfaction. Providers were overwhelmingly pleased with their teledermatology experience. All responses to the survey indicated that they would use the service again and that it increases access and improves health care. Provider workflow was facilitated by support staff who provided valuable services such as acquiring

and uploading images into the medical record. The service enables PCPs to remain an integral component of the management team and provides opportunities for increased firsthand experience in the management of common dermatologic conditions.

Limiting factors of the study include the lack of evaluation of long-term follow-up, lack of findings on whether teledermatology reduced the number of future in-person dermatologic consults required by patients who received teledermatology consults for their initial dermatologic chief complaint, and small sample size. The patient satisfaction survey was completed by only a small set of patients evaluated in the cohort.

CONCLUSIONS

Physician-to-physician outpatient SAF teledermatology consultations are an effective means to provide rapid skin care and appropriate triage within a shared EHR, as well as to maintain PCP continuity of care. Patient and physician satisfaction favored acceptance of this mode of skin care. This study demonstrates that physician-to-physician consultative SAF teledermatology can be a model for managed care organizations to provide access to outpatient consultative dermatologic care in an integrated care delivery system if patients are experiencing difficulty with delayed in-person visits. ■

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