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Impact of the COVID-19 pandemic on inpatient dermatology consult patterns at a tertiary care hospital: A retrospective cohort study



To the Editor: The early phase of the coronavirus disease 2019 (COVID-19) pandemic had a profound global impact on medical practice and patient behaviors.¹ The impact of the pandemic on inpatient dermatology consultations in the United States has not been reported, to our knowledge. We analyzed all patients who received a dermatology consultation at our hospital from March to May 2020 compared with the same period in 2019.

After obtaining Institutional Review Board approval, we retrospectively analyzed electronic medical records of adult patients who received a dermatology consult at Vanderbilt University Medical Center during an inpatient admission or from the emergency department between March 15 and May 31 for the years 2019 and 2020. Differences were

tested using the χ^2 , *t* test, or Mann-Whitney test via GraphPad Prism 8 software (GraphPad Software, San Diego, CA).

A total of 106 dermatology consults were seen during the study period in 2020 compared with 149 in 2019 (Table I).² In 2020, 42% of consults were completed via teledermatology (Table II).² The mean number of consults per week was significantly reduced in 2020 compared with 2019 (9.5 vs 13.5, *P* = .04). There was a significant reduction in consults for patients who presented for a primary dermatologic complaint in 2020 (23% vs 52%, *P* < .01). In contrast, the frequency of consults for patients who originally presented to the hospital for a nondermatologic problem was not significantly different (7.4 vs 6.5 consults per week, *P* = .5).

Almost 25% of virtual consults were later seen in person, with a change of diagnosis in nearly half of cases. Ultimately, virtual consultations resulted in significantly reduced diagnostic certainty, with

Table I. Demographics and characteristics of patients who received a dermatology consult between March 15 and May 31

Variable*	All consults		P value†	Presentation for primary dermatologic problem		P value†	Non-dermatologic presentation		P value†
	2019	2020		2019	2020		2019	2020	
Total, No.	149	106		77	24		72	82	
Consults/week, mean (SD), No.	13.5 (4.4)	9.5 (4.1)	.04‡	6.9 (2.7)	2.2 (1.2)	<.01‡	6.5 (2.8)	7.4 (3.2)	.53‡
Age, mean (SD), y	53.7 (16.9)	52.5 (17.3)	.57‡	52.2 (18.5)	56.0 (17.5)	.36‡	55.4 (14.8)	51.5 (17.3)	.13‡
Male sex	74 (49.7)	52 (49.1)	.92§	34 (44.2)	9 (37.5)	.58§	40 (55.6)	43 (52.4)	.70§
Uninsured	18 (12.1)	17 (16.0)	.37§	12 (15.6)	4 (16.7)	.90§	6 (8.3)	13 (15.9)	.16§
Primary dermatologic problem	77 (51.7)	24 (22.6)	<.01§
Presented through ED [¶]	70 (47.0)	33 (31.1)	.01§	38 (49.4)	8 (33.3)	.17§	32 (44.4)	25 (30.5)	.07§
ED consult	18 (12.1)	18 (17.0)	.27§	16 (20.8)	12 (50.0)	<.01§	2 (2.8)	6 (7.3)	.21§
Length of stay (admitted pts), mean (SD), d	12.4 (25.4)	12.1 (20.4)	.53	5.1 (3.8)	3.4 (2.6)	.06	19.7 (34.3)	14.6 (22.5)	.43
Common outpatient diagnosis [#]	64 (43.0)	24 (22.6)	<.01§	29 (37.7)	5 (20.8)	.13§	35 (48.6)	19 (23.2)	<.01§
Life-threatening diagnosis ^{**}	11 (7.4)	13 (12.3)	.19§	5 (6.5)	3 (12.5)	.34§	6 (8.3)	10 (12.2)	.43§
Follow-up recommended	37 (26.4)	41 (40.6)	.02§	23 (31.5)	15 (65.2)	<.01§	14 (20.9)	26 (33/3)	.09§

ED, Emergency department; No., number; pts, patient.

*Categorical data are presented as number (%) and continuous data as indicated.

†Bold *P* values are statistically significant.

‡Unpaired *t* test with the Welch correction.

§ χ^2 test.

||Mann-Whitney test

¶ED presentations compared with direct admissions (scheduled operations and clinic admissions) and transfers from other hospitals.

#Outpatient diagnoses were defined as nonerythrodermic eczematous dermatoses (including atopic dermatitis, contact dermatitis, seborrheic dermatitis, stasis dermatitis, and eczematous dermatitis not otherwise specified), nonerythrodermic psoriasis vulgaris, cutaneous malignant neoplasms, cutaneous benign neoplasms, rosacea, acne vulgaris, hidradenitis suppurativa, acne conglobata, dissecting cellulitis, lichen simplex chronicus, lichen planus, alopecia, dyspigmentation, folliculitis, arthropod assault, scabies, tinea, onychomycosis, verrucae, intertrigo, and urticaria. These diagnoses were chosen based on literature review² and clinical judgment. Diseases that have a wide spectrum of severity (eg, cellulitis) were not grouped with outpatient diagnoses because the severity of presentation could not be reliably determined by chart review.

**Life-threatening diagnoses were defined as Stevens–Johnson/toxic epidermal necrolysis, drug reaction with eosinophilia and systemic symptoms, toxic shock syndrome, staphylococcal scalded skin syndrome, angioinvasive fungal infection, medium vessel vasculitis, calciphylaxis, purpura fulminans, metastatic malignancy, leukemia cutis, and erythroderma of any type.

Table II. Comparison of in-person vs virtual dermatology consults during the COVID-19 pandemic between March 15 and May 31

Variable*	In-person	Virtual	P value [†]
Total, No.	61	45	
Age, mean (SD), y	54.4 (16.7)	49.9 (18.0)	.19 [‡]
Male sex	27 (44.3)	25 (55.6)	.25 [§]
Primary dermatologic problem	9 (14.8)	15 (33.3)	.024 [§]
Presented through ED [¶]	23 (37.7)	10 (22.2)	.09 [§]
ED consult	6 (9.8)	12 (26.7)	.023 [§]
ED discharge after ED consult	2 (33.3)	3 (25)	.71 [§]
Length of stay (admitted pts), mean (SD), d	12.6 (23.8)	11.5 (14.6)	.29
Common outpatient diagnosis [#]	14 (23.0)	10 (22.2)	.93 [§]
Life-threatening diagnosis ^{**}	10 (16.4)	3 (6.7)	.13 [§]
Follow-up recommended	23 (39.0)	18 (42.9)	.70 [§]
Consult for known dermatologic diagnosis	12 (19.7)	10 (22.2)	.75 [§]
Virtual consults later seen in person		11 (24.4)	
In-person visit delayed due to pending/positive COVID		7 (63.6)	
Presumed virtual diagnosis changed after in-person visit		5 (45.4)	
Mean (SD) number of derm notes	2.3 (1.8)	2.0 (1.2)	.49 [§]
Mean (SD) number of derm notes (minus virtual consults later seen in person)	2.3 (1.8)	1.5 (0.8)	.017
Biopsy done	33 (54.1)	12 (26.7)	<.01 [§]
Biopsy by derm	32 (97.0)	8 (67.7)	<.01 [§]
Definitive diagnosis made ^{††}	55 (90.2)	27 (60)	<.01 [§]

ED, Emergency department; No., number; pts, patient.

*Categorical data are presented as number (%) and continuous data as indicated.

[†]Bold P values are statistically significant.

[‡]Unpaired t test with the Welch correction.

[§] χ^2 test.

^{||}Mann-Whitney test

[¶]ED presentations compared with direct admissions (scheduled surgeries and clinic admissions) and transfers from other hospitals.

[#]Outpatient diagnoses were defined as: nonerythrodermic eczematous dermatoses (including atopic dermatitis, contact dermatitis, seborrheic dermatitis, stasis dermatitis, and eczematous dermatitis not otherwise specified), nonerythrodermic psoriasis vulgaris, cutaneous malignant neoplasms, cutaneous benign neoplasms, rosacea, acne vulgaris, hidradenitis suppurativa, acne conglobata, dissecting cellulitis, lichen simplex chronicus, lichen planus, alopecia, dyspigmentation, folliculitis, arthropod assault, scabies, tinea, onychomycosis, verrucae, intertrigo, and urticaria. These diagnoses were chosen based on literature review² and clinical judgment. Diseases that have a wide spectrum of severity (eg, cellulitis) were not grouped with outpatient diagnoses as the severity of presentation could not be reliably determined by chart review.

^{**}Life-threatening diagnoses were defined as Stevens–Johnson/toxic epidermal necrolysis, drug reaction with eosinophilia and systemic symptoms, toxic shock syndrome, staphylococcal scalded skin syndrome, angioinvasive fungal infection, medium vessel vasculitis, calciphylaxis, purpura fulminans, metastatic malignancy, leukemia cutis, and erythroderma of any type.

^{††}“Definitive diagnosis” was defined as a single diagnosis listed on the consult note or final progress note, or pathology report with a single diagnosis listed.

only 60% of consults resulting in a definitive diagnosis compared with 90% of in-person consults. When looking at only the subset of virtual consultations that were never seen in-person, a definitive diagnosis was made less than half of the time.

During the early phase of the COVID-19 pandemic, our inpatient dermatology consult service shifted to include care via teledermatology. We found no evidence that patients with severe dermatologic illness avoided the hospital.

Completion of a virtual consult during the COVID-19 pandemic was associated with decreased diagnostic certainty compared with in-person consults. A prospective study on teledermatology found

that the primary diagnosis given by a virtual consult was concordant with that of an in-person consult in 67% of cases.³ Although the methodologies of our study and the study by Gabel et al³ are too disparate to directly compare results, our experience indicates that further research on inpatient teledermatology and the criteria for which it might be safely and effectively used is warranted.

It is our opinion that the in-person examination remains important for inpatient dermatology, as highlighted by a recent case report of an incidental melanoma that would have been missed had an inpatient consult been conducted via teledermatology during the pandemic.⁴ Our consultation service similarly found an incidental melanoma

during an in-patient visit that would have been missed via teledermatology. Further studies will be needed to understand how reduced overall emergency department visits for dermatologic complaints and an increased incidence of virtual consults during this period will affect long-term outcomes for patients.

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Patient and physician perspectives on teledermatology at an academic dermatology department amid the COVID-19 pandemic



To the Editor: In the era of COVID-19, dermatology practices have rapidly adopted teledermatology.^{1,2} Prepandemic research showed physician and patient satisfaction; however, these studies included groups who chose the telemedicine medium.^{3,4} Pandemic-related restrictions on in-person care catalyzed a

broader adoption of telemedicine among both physicians and patients. This study examines the experiences of both groups with teledermatology during the COVID-19 pandemic.

We surveyed the clinical faculty in the Department of Dermatology at Yale School of Medicine and patients seen via Epic MyChart (Epic, Verona, WI) synchronous video visits from mid-March to mid-May 2020. We performed an ordinal logistic regression using the polr package in R, version 3.6.1 (R Foundation for Statistical Computing, Vienna, Austria) to compare patient and physician perceptions. We excluded all *unable to answer* responses from the regression analysis.

Faculty were amenable to managing many skin conditions solely by telemedicine or by telemedicine in conjunction with in-person visits. However, 23 of 24 faculty members (96%) believed that total body skin examination should only be managed through in-person visits (Fig 1).

Table I summarizes physician and patient perspectives on virtual care; 50% of faculty reported prior experience with teledermatology, although the majority had used only store-and-forward.⁵

All physician respondents believed that teledermatology allowed them to contribute to efforts to reduce in-person care; however, 87% of physicians responded that some patients' skin cancer or skin disease likely progressed because of COVID-related avoidance of interaction with in-office medical care (Table I).

Finally, most patients reported that teledermatology was time saving. Including travel, wait time, and time off from work, 65% of patients reported saving at least 1 hour of time (Table I).

Patients were nearly 50 times more likely than faculty to agree or strongly agree that the quality of care during a telemedicine visit was equal to an in-office visit (odds ratio, 48.28; 95% confidence interval, 19.55-128.40; $P < .001$). Patients were nearly 20 times as likely as faculty to agree or strongly agree that the picture and video quality during the video visit were good (odds ratio, 18.05; 95% CI, 8.56-38.75; $P < .001$). The majority of both patients and physicians reported future interest in video visits ($P = .47$) (Table I).

Our study indicates that patients and physicians are overwhelmingly interested in teledermatology in the future. Although most physicians had limited previous experience, the majority believed that teledermatology allowed them to contribute to COVID-19 control efforts and that many conditions could be managed by telemedicine alone or by telemedicine in conjunction with office visits. However, our study highlights important