Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

conditions that require full-thickness pathologic evaluation.[4]

This analysis may lack generalizability to commercially insured patients. Additionally, specialty–specific biopsy totals are likely conservative due to the suppression of small biopsy values (≤10) at the level of each provider. Despite shortcomings, this analysis supports an overall growth of skin biopsies and a predominance of tangential biopsies across various subsets of dermatologists and regions. It also reflects the growing role of dermatology NPCs in addressing dermatologic care needs and the potential importance of standardized training and education to support the accuracy of biopsies performed by nondermatologists.

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Key words: dermatology; incisional; Medicare; nonphysician clinicians; punch; skin biopsies; tangential.

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Conflicts of interest

Dr Feng is a consultant for Cytrellis Biosystems, Inc and Soliton, Inc. Dr Gronbeck has no conflicts of interest to declare.

REFERENCES

1. Skaggs R, Coldiron B. Skin biopsy and skin cancer treatment use in the Medicare population, 1993 to 2016. *J Am Acad Dermatol*. 2021;84(1):53-59. https://doi.org/10.1016/j.jaad.2020.06.030
2. Kircik LH. A closer look at the new biopsy codes. *Cutis*. 2019;103(3):122-123.
3. Medicare physician & other practitioners—by provider and service. Centers for Medicare & Medicaid Services. Accessed September 4, 2021. https://data.cms.gov/provider-summary-by-type-of-service/medicare-physician-other-practitioners/medicare-physician-other-practitioners-by-provider-and-service
4. Desai S, Creadore A, Duncan LM, et al. Comparison of shave and punch biopsy utilization among dermatology practices. *Cutis*. 2021;107(3):151-152. https://doi.org/10.12788/cutis.0206
5. Patel S, Nguyen BT. Characterization of biopsies by dermatologists and nonphysician providers in the Medicare population: a rapidly changing landscape. *Dermatol Surg*. 2021;47:1337-1341. https://doi.org/10.1097/dss.0000000000003150

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Pediatric teledermatology: A retrospective review of 1199 encounters during the COVID-19 pandemic

To the Editor: The incorporation of telemedicine into routine dermatologic care during COVID-19 has created new opportunities to evaluate and optimize our existing teledermatology platforms. Previous pediatric studies have shown that teledermatology improves access to care[1,2] while offering opportunities to improve show rates and reduce wait times.[3] We performed a retrospective review of 1110 video visits (live, interactive, patient-to-provider) and 89 e-consults (store-and-forward, provider-to-provider) during the early COVID-19 pandemic (March 18 to May 1, 2020) to acquire key information on continued applications of teledermatology.

In addition to collecting patient demographics (Table I) and encounter-specific data (eg, diagnoses and referring provider), we reviewed dermatology provider surveys embedded within each virtual encounter. Video visit surveys asked providers about connectivity issues, video quality, and the use of supplementary photographs. Logistic regression was performed to identify associated factors (Table II). For e-consults, providers indicated whether the encounter was sufficient to assist in diagnosis or provide advice on treatment. Providers also noted when additional workup and/or triage to an in-person visit were recommended.

Primary care providers placed the most e-consults (36.0%), followed by inpatient providers (30.3%), emergency department providers (22.5%), and other subspecialty services (11.2%). The overall mean turnaround time was 5.84 hours (range, 0.07-188.13 hours), though the emergency department typically received responses within 90 minutes. Providers reported assisting in diagnosis and advising on treatment in more than 90% of the e-consults. Further workup and/or triage to an in-person visit were recommended about half the time (48.8%).

Providers reported issues with connectivity (26.5%) and inadequate video quality (25.5%) in about one-fourth of video visits. Most video visit providers (76%) reported using parent-submitted

Table I. Patient characteristics for all visit types

Characteristic	Pre-COVID in-person visits (N = 18,188), n (%)	COVID in-person visits (N = 347), n (%)	COVID e-consults (N = 89), n (%)	COVID video visits (N = 1110), n (%)
Age group, y (%)				
0-1	4053 (22.3)	128 (36.9)	28 (31.5)	303 (27.3)
2-7	4000 (22.0)	74 (21.3)	17 (19.1)	197 (17.7)
8-13	4628 (25.4)	67 (19.3)	21 (23.5)	219 (19.7)
14-18	4911 (27.0)	72 (20.7)	22 (24.7)	354 (31.9)
Over 18	596 (3.3)	6 (1.7)	1 (1.1)	37 (3.3)
Sex				
Female	10,149 (55.8)	191 (55.0)	36 (40.4)	604 (54.4)
Male	8039 (44.2)	156 (45.0)	53 (59.5)	506 (45.6)
Race				
Black	4289 (23.6)	46 (13.3)	22 (24.7)	212 (19.1)
Other	5510 (30.2)	68 (19.6)	24 (30.3)	270 (24.5)
White	9970 (54.8)	233 (67.1)	40 (44.9)	683 (61.5)
Ethnicity				
Hispanic or Latino	1850 (10.2)	31 (8.9)	6 (6.7)	108 (9.7)
Not Hispanic or Latino	16,338 (89.8)	316 (91.1)	83 (92.3)	990 (89.2)
Insurance				
Private	9037 (49.7)	242 (69.7)	61 (68.5)	771 (69.6)
Public	8822 (48.5)	83 (23.9)	27 (30.3)	337 (30.4)
Self-pay	329 (1.8)	22 (6.3)	1 (0.08)	0

photographs. When photographs were not submitted, providers said they would have helped with the diagnosis most of the time (73.4%).

The prevalence of public insurance across teledermatology encounters was significantly lower than our practice baseline, and during video visits with patients on Medicaid, providers were more likely to report inadequate video quality. We also observed a significant reduction in Black patients receiving care. These findings are important because disparities in access to dermatologic care disproportionally affect minority children and those enrolled in Medicaid.[4] A platform like e-consults, which relies on providers and does not require families to have internet access, could address these inequities, although widespread implementation would require reimbursement policies that cover several forms of teledermatology.

We learned that e-consult providers primarily assisted in diagnosis or treatment recommendations. Because the turnaround time was relatively quick (6 hours) and the median wait time to see a pediatric dermatologist in our region is approximately 4 months,[3] we see e-consults as an opportunity to expedite care, enhance knowledge among requesting providers, and limit redundant consults.

Providers reported connectivity issues about one-fourth of the time, although we saw a significant reduction in connectivity issues and improvement in the perceived video quality over time (likely reflecting provider and patient acclimation). Given that previous studies have shown both store-and-forward and live interactive teledermatology to be comparable diagnostically,[2,5] a hybrid model may be ideal as store-and-forward modalities eliminate connectivity issues altogether by not requiring a live interactive experience.

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Table II. Factors associated with provider-reported connectivity issues, video quality, and submission of photographs*

	Connectivity issues (Y/N) (N = 1042)			Video quality adequate (Y/N) (N = 1035)			Photographs submitted (Y/N) (N = 1054)		
	n	OR (95% CI)	*P*	n	OR (95% CI)	*P*	n	OR (95% CI)	*P*
Age group, y									
0-1	198	Reference	-	197	Reference	-	200	Reference	-
1-7	278	1.66 (1-2.75)	.051	276	0.6 (0.36-0.99)	**.045**	279	1.70 (0.91-3.15)	.095
7-13	332	1.43 (0.8-2.58)	.229	197	0.64 (0.32-1.29)	.151	201	0.74 (0.38-1.40)	.352
13-18	36	1.58 (0.87-2.87)	.134	329	0.66 (0.37-1.17)	.223	337	0.30 (0.12-0.74)	**.009**
Over 18	198	2.52 (1.01-6.29)	**.047**	36	1.14 (0.39-3.28)	.812	37	0.89 (0.46-1.69)	.729
Insurance									
Commercial	722	Reference	-	717	Reference	-	732	Reference	-
Public	320	0.95 (0.69-1.3)	.728	318	0.7 (0.51-0.95)	**.022**	322	0.74 (0.53-1.05)	.087
Diagnosis									
Acne	225	Reference	-	223	Reference	-	228	Reference	-
Adnexal skin disorder	24	3.16 (1.23-8.09)	**.017**	24	1.43 (0.49-4.15)	.51	25	0.49 (0.17-1.4)	.181
Alopecia	63	1.01 (0.49-2.08)	.984	63	4.7 (1.71-12.94)	**.003**	63	0.35 (0.17-0.71)	**.003**
Dermatitis	295	1.37 (0.81-2.3)	.237	295	1.1 (0.65-1.84)	.728	297	0.52 (0.3-0.89)	**.018**
Hemangioma	131	1.18 (0.57-2.45)	.647	130	1.11 (0.54-2.3)	.774	132	1.4 (0.58-3.34)	.454
Infection or infestation	63	2.07 (1.02-4.22)	**.044**	63	0.59 (0.29-1.18)	.137	64	0.93 (0.37-2.33)	.881
Melanocytic nevus	62	1.71 (0.83-3.54)	.148	62	0.59 (0.29-1.18)	.133	63	1.51 (0.57-4.02)	.408
Other	78	0.99 (0.51-1.93)	.971	77	1.11 (0.58-2.12)	.759	78	0.6 (0.31-1.15)	.126
Pigmentary disorder	24	0.96 (0.32-2.87)	.945	23	1.38 (0.46-4.11)	.563	26	2.61 (0.56-12.14)	.221
Psoriasis	31	1.02 (0.42-2.51)	.963	31	1.09 (0.45-2.67)	.845	31	0.66 (0.27-1.64)	.373
Rash	46	0.42 (0.15-1.17)	.097	44	0.87 (0.39-1.93)	.734	47	0.73 (0.3-1.77)	.486
Study week									
Week 1	32	Reference	-	31	Reference	-	38	Reference	-
Week 2	132	0.79 (0.35-1.79)	.575	130	1.09 (0.46-2.6)	.841	137	0.65 (0.29-1.43)	.282
Week 3	142	0.7 (0.31-1.57)	.382	140	1.26 (0.53-3)	.599	143	1.86 (0.81-4.25)	.144
Week 4	168	0.87 (0.39-1.93)	.735	167	1.45 (0.62-3.4)	.396	168	2.44 (1.07-5.57)	**.033**
Week 5	223	0.34 (0.15-0.75)	**.007**	222	1.54 (0.67-3.57)	.312	223	2.12 (0.97-4.62)	.059
Week 6	260	0.26 (0.12-0.57)	**.001**	260	3.06 (1.31-7.17)	**.01**	260	2.14 (0.99-4.64)	.053
Week 7	85	0.18 (0.07-0.48)	**.001**	85	2.63 (1.01-6.88)	**.049**	85	2.17 (0.87-5.41)	.095
Visit type									
Follow-up	695	Reference	-	691	Reference	-	703	Reference	-
New patient	347	0.89 (0.64-1.24)	.489	344	0.64 (0.47-0.88)	**.006**	351	2.31 (1.54-3.45)	**<.001**

OR, Odds ratio.
*Bold indicates statistical significance.

Key words: COVID-19; e-consults; store-and-forward; teledermatology; telehealth; telemedicine; video visits.

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Conflicts of interest

None disclosed.

REFERENCES

1. Utidjian L, Abramson E. Pediatric telehealth: opportunities and challenges. *Pediatr Clin North Am*. 2016;63(2):367-378. https://doi.org/10.1016/j.pcl.2015.11.006
2. O'Connor DM, Jew OS, Perman MJ, Castelo-Soccio LA, Winston FK, McMahon PJ. Diagnostic accuracy of pediatric teledermatology using parent-submitted photographs: a randomized clinical trial. *JAMA Dermatol*. 2017;153(12):1243-1248. https://doi.org/10.1001/jamadermatol.2017.4280
3. Stephens MR, Murthy AS, McMahon PJ. Wait times, health care touchpoints, and nonattendance in an academic pediatric dermatology clinic. *Pediatr Dermatol*. 2019;36(6):893-897. https://doi.org/10.1111/pde.13943
4. Naka F, Makkar H, Lu J. Teledermatology: Kids are not just little people. *Clin Dermatol*. 2017;35(6):594-600. https://doi.org/10.1016/j.clindermatol.2017.08.009
5. Heffner VA, Lyon VB, Brousseau DC, Holland KE, Yen K. Store--and-forward teledermatology versus in-person visits: a comparison in pediatric teledermatology clinic. *J Am Acad Dermatol*. 2009;60(6):956-961. https://doi.org/10.1016/j.jaad.2008.11.026

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