

LETTER TO THE EDITOR

Store-and-forward teledermatology in the era of COVID-19: A pilot study

To the Editor:

Coronavirus disease 2019 (COVID-19) represents a global health crisis in which personal protective equipment (PPE) has become increasingly limited. Dermatologists are poised to think creatively and use technology, such as teledermatology, to innovate existing workflows and optimize dermatologic care.

We conducted a pilot, retrospective cohort study to evaluate the utility of store-and-forward teledermatology during the COVID-19 pandemic. We included patients seen by the inpatient dermatology consult service at the Ohio State University Wexner Medical Center from 16 March 2020 to 20 March 2020. We used a recently proposed algorithm for how hospital settings can initiate and use telemedicine consultative services during the COVID-19 pandemic (Figure 1). An integrated platform of store-and-forward teledermatology consults

within the electronic medical record (Epic, Madison, WI) was used with a secure smart phone application (Haiku or Canto; Epic). Team members utilized the Cisco WebEx virtual conference call system to conduct Health Insurance Portability and Accountability Act compliant discussions about patients. Clinical data were abstracted by a member of the dermatology consult service.

Sixteen patients (nine women and seven men) were evaluated using store-and-forward teledermatology services (Table 1). The most common consulting services were hematology and internal medicine (both 37.5%). In 43.8% of cases, the consulting service did not have an initial diagnosis for the patient. A median of 8 photographs (IQR 3-17 photographs) were provided for each patient. Half of photographs were determined to be high quality, while half were moderate quality. At the consult date, nearly all patients had unknown

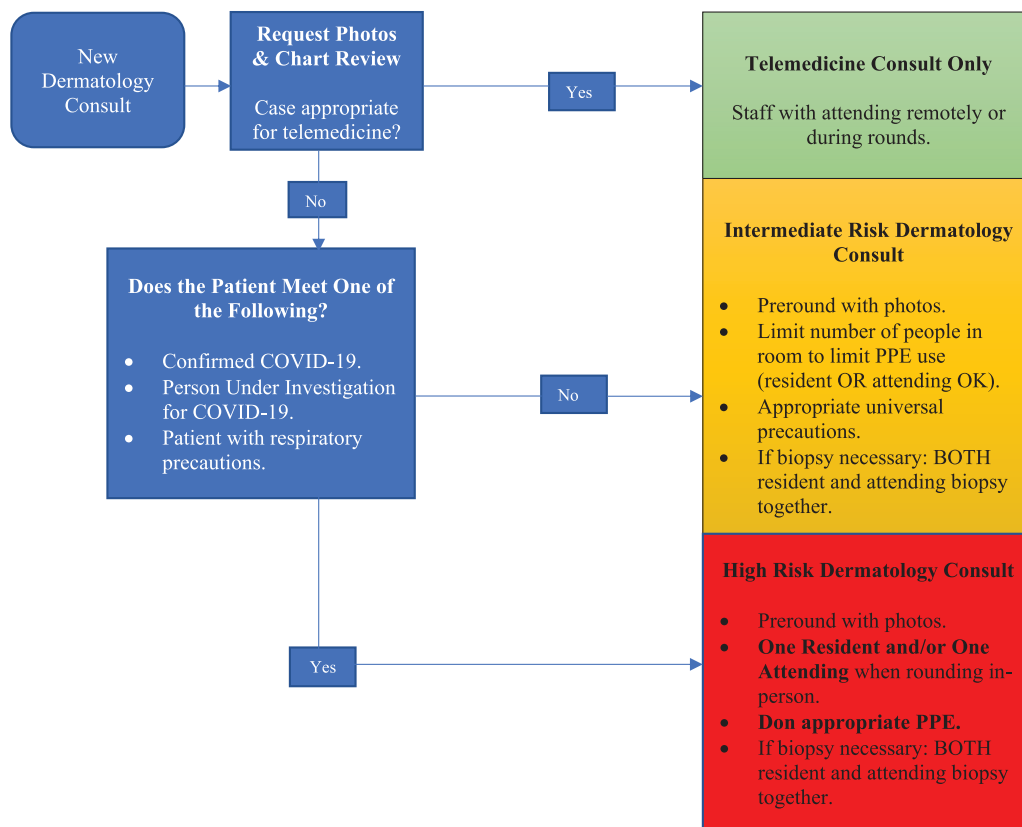


FIGURE 1 Algorithm for the use of store-and-forward teledermatology—algorithm developed particularly for COVID-19 in which limiting in-person patient encounters can decrease virus transmission

TABLE 1 Patients seen during teledermatology pilot study—descriptive characteristics of patients seen over the course of 1 week by the inpatient dermatology service at Ohio State University Wexner Medical Center

Age # (years)	Sex	Consulting service	Internal medicine	Consulting service diagnosis	Shingles	Dermatology initial diagnosis	Shingles	Certainty of initial diagnosis	Dermatology final diagnosis	ACD with IId reaction	Number of photos provided	Photo quality	Teletriage level of comfort	Patient seen in person?	Days until seen in person	Reason	Level of precautions at time of consult	COVID-19 status at consult	Final COVID-19 status
1	29	F	Internal medicine	Shingles	Shingles	Moderate	Moderate	Moderate	ACD with IId reaction	19	High	Moderate	Yes	2	Unable to confirm diagnosis	Contact	Unknown, not tested	Unknown, not tested	
2	21	F	Internal medicine	None	Morbilloform drug	High	High	High	Morbilloform drug	6	High	Moderate	Yes	0	Other - assess for necrosis	Contact and airborne	Unknown, not tested	Negative	
3	74	M	Oncology	None	Cutaneous metastases	Moderate	Moderate	Moderate	Cutaneous metastases	7	High	High	Yes	0	Essential condition warranting in person treatment	Universal	Unknown, not tested	Unknown, not tested	
4	45	F	Internal medicine	SJS/TEN	Nutritional dermatitis	Moderate	Moderate	Moderate	Nutritional dermatitis, vasopressor-induced skin necrosis	35	Moderate	High	No	N/A	N/A	Contact and airborne	Unknown, not tested	Negative	
5	64	M	Hematology	None	Drug-induced acneiform eruption	Somewhat	High	Moderate	Drug-induced acneiform eruption	3	High	Moderate	No	N/A	N/A	Universal	Unknown, not tested	Unknown, not tested	
6	27	F	Internal medicine	Eczema flare v. cellulitis	Eczema flare	High	Moderate	High	Eczema flare	17	Moderate	High	No	N/A	N/A	Universal	Unknown, not tested	Unknown, not tested	
7	62	M	Neurosurgery	None	ACD with possible herpeticum and/or impetiginization	Moderate	Moderate	Moderate	ACD	8	Moderate	Moderate	No	N/A	N/A	Universal	Unknown, not tested	Unknown, not tested	
8	60	M	Internal medicine	Cellulitis	ACD	Moderate	Moderate	Moderate	ACD	3	High	High	No	N/A	N/A	Universal	Unknown, not tested	Unknown, not tested	
9	58	M	Hematology	None	Vasculitis, toxic erythema of chemotherapy	High	Moderate	Moderate	Drug-induced purpura	14	Moderate	Moderate	Yes	1	Essential condition warranting in person treatment	Universal	Unknown, not tested	Unknown, not tested	

TABLE 1 (Continued)

Age # (years)	Sex	Consulting service	Consulting service diagnosis	Consulting service diagnosis	Dermatology initial diagnosis	Certainty of initial diagnosis	Dermatology final diagnosis	Number of photos provided	Photo quality	Teletriage level of comfort	Patient seen in person?	Days until seen in person	Reason	Level of precautions at time of consult	COVID-19 status at consult	Final COVID-19 status
10	42	F	Gynecology-oncology	None	Allergic vs irritant contact dermatitis	High	Allergic vs irritant contact dermatitis	20	Moderate	High	No	N/A	N/A	Universal	Unknown, not tested	Unknown, not tested
11	29	M	Hematology	Vasculitis	Ischemia 2/2 thromboembolism	Moderate	Ischemia due to thromboembolism	3	Moderate	Moderate	No	N/A	N/A	Universal	Unknown, not tested	Unknown, not tested
12	47	M	Internal medicine	None	HSV	Moderate	HSV	1	High	Moderate	No	N/A	N/A	Contact	Unknown, not tested	Unknown, not tested
13	69	F	Hematology	Leukemia cutis	Bite fibroma, NMSC	High	Bite fibroma, NMSC	2	High	High	No	N/A	N/A	Neutropenic, contact, and droplet	Negative	Negative
14	49	F	Hematology	Drug allergy	Toxic erythema of chemotherapy	Somewhat	Toxic erythema of chemotherapy	16	High	Moderate	No	N/A	N/A	Neutropenic	Unknown, not tested	Unknown, not tested
15	56	F	Hematology	Calciphylaxis	Calciphylaxis	Moderate	Thrombotic vasculopathy	8	Moderate	Moderate	Yes	1	Unable to confirm diagnosis	Universal	Unknown, not tested	Unknown, not tested
16	81	F	Oncology	Bullous pemphigoid flare	Bullous pemphigoid flare	High	Bullous pemphigoid flare	10	Moderate	Moderate	No	N/A	N/A	Contact and airborne	Unknown, not tested	Negative

Abbreviations: ACD, allergic contact dermatitis; COVID-19, coronavirus disease 2019; HSV, Herpes simplex virus; NMSC, non-melanoma skin cancer; SJS/TEN, Stevens-Johnson syndrome and toxic epidermal necrolysis.


COVID-19 status (93.8%) and only 25% of patients had a negative final COVID-19 diagnosis. Two physicians avoided unnecessary daily contact with 11 patients. Five of these patients ultimately required in-person evaluation by dermatology team members, in which three punch biopsies and one shave biopsy were performed. In utilizing tele-dermatology, 20 pairs of gloves, 16 gowns, 10 N95 masks, and 4 surgical masks were conserved over the course of a single week.

Our findings demonstrate store-and-forward teledermatology can reduce unnecessary in-person patient evaluation and management. Past reports of store-and-forward teledermatology use in clinic settings found as many as 71% of cases resulted in new diagnoses with treatment changes in 60% of patients.¹ In our study, 13 of 16 (81.3%) of electronic consultations resulted in new diagnoses, which informed treatment changes. Limiting in-person interactions are essential to mitigating transmission of novel coronavirus SARS-CoV-2, which can persist on surfaces for 72 hours² and be transmitted by asymptomatic individuals.³ In addition, PPE is increasingly scarce and expensive, prompting the *Journal of the American Medical Association* to publish an editorial soliciting creative ideas.⁴ Our findings suggest that tele-dermatology may be used in inpatient settings during the COVID-19 pandemic to conserve precious resources.

Limitations of our study include the small sample size, lack of a control group, and retrospective nature of the study. Our study also lacked metrics to evaluate the effect of inpatient teledermatology on quality of patient care and resident education. Nonetheless, we believe that our data suggest the need for greater investigation of this issue and validation of our results with larger studies under normal circumstances.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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