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Teledermatology as pedagogy: diagnostic and management concordance between resident and attending dermatologists

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Abstract

To the Editor: Teledermatology may serve as a platform for the education of dermatology residents.^{1–3} Few studies have measured diagnostic^{1–2} and management¹ concordance between residents evaluating patients in-person and attending dermatologists supervising residents via teledermatology. We report diagnostic and management concordance between resident and attending dermatologists responding to store-and-forward teledermatology consults submitted by primary care providers and discuss implications for resident education.

Keywords

teledermatology; mobile; store-and-forward; outpatient dermatology consultation; telemedicine; resident education; technology

We performed a prospective study between January and November 2013 with inclusion of 84 consults encompassing 90 dermatologic conditions. This study received approval from the Philadelphia Field Initiating Group of Human Immunodeficiency Virus Trials,

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Philadelphia Department of Public Health, and University of Pennsylvania institutional review boards. Verbal informed consent and Health Insurance Portability and Accountability Act authorization were obtained from patients; written informed consent was obtained from providers.

Consults were submitted to the University of Pennsylvania by 25 primary care providers at the Jonathan Lax Center, the Dr. Bennett L. Johnson, Jr. Sayre Health Center, and eight Philadelphia Department of Public Health centers using the AccessDerm (Vignet Corporation, Fairfax, VA) mobile platform.⁴ Diagnoses and management plans, initially drafted by dermatology residents, were reviewed, edited, and submitted by attending dermatologists. Nine residents and nine attending dermatologists responded to consults. For each dermatologic condition, two investigators (CAN, JT) independently determined the concordance of differential diagnoses and management plans between resident and attending dermatologists. Cohen's κ assessing inter-rater reliability (95% confidence interval) for diagnostic and management concordance between the two investigators were 0.94 (0.91–0.98) and 0.87 (0.78–0.90), respectively. Statistical analyses were performed in Stata 12.1 (StatCorp LP, College Station, TX).

Each resident responded to a median (interquartile range) of 9 (4–15) consults. The number of responses stratified by dermatology training year was: 10 (12%) first, 29 (34%) second, and 45 (54%) third year residents. Based on the leading diagnosis of the attending dermatologist or definitive diagnosis when available, dermatologic conditions were classified into the following categories: 24 (27%) eczematous conditions, 13 (14%) infectious diseases, 7 (8%) benign tumors or proliferations, 6 (7%) papulosquamous conditions, 5 (6%) pigmented disorders, 4 (4%) acneiform or follicular occlusion disorders, 4 (4%) premalignant or malignant lesions, 23 (26%) other, and 4 (4%) indeterminate.

Diagnoses and management plans between resident and attending dermatologists were fully concordant for 53% and 65% of dermatologic conditions, respectively (Figure 1). Table I categorizes the changes made by attending dermatologists for those conditions with at least partial management discordance (adapted from Lamel et al⁵). Most changes were consistent with recommendation for education or observation (53%) and medication initiation or discontinuation (50%). Recommendation for in-person evaluation was concordant in 93% of consults.

With the development of sustainable teledermatology programs, it is important for dermatologists to become familiar with the strengths and limitations of this practice model. Our data revealed at least partial diagnostic and management discordance between resident and attending dermatologists for 47% and 35% of dermatologic conditions, respectively. Although limited by small sample size, this study suggests that teledermatology provides residents an opportunity for practice-based learning. Further research is required to evaluate educational outcome measures.

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Figure 1.

Diagnostic and management concordance between resident and attending dermatologists.

* Designation of “concordant” required complete agreement in diagnoses or management plan between resident and attending dermatologist.

† Designation of “partially concordant” was defined by agreement in at least one but not all diagnoses or partial agreement in management plan with one or more of the following categories of change between resident and attending dermatologist: recommendation for education or observation, medication initiation or discontinuation, recommendation for laboratory testing, change in medication dosage or vehicle, recommendation for procedural intervention.

†† Designation of “discordant” was defined by no agreement in diagnoses or management plan between resident and attending dermatologist.

Table I

Categories of change in management

Category, No. (%)	N = 32
Recommendation for education or observation	17 (53)
Medication initiation or discontinuation	16 (50)
Recommendation for laboratory testing	5 (16)
Change in medication dosage or vehicle *	2 (6)
Recommendation for procedural intervention †	1 (3)

* One change in medication dosage or vehicle pertained to oral antihistamines and the other pertained to a topical steroid.

† The recommendation for procedural intervention pertained to a biopsy.