Dermoscopy of Concerning Pigmented Lesions and Primary Care Providers' Referrals at Intervals After Randomized Trial of Mastery Learning

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Patients visit their primary care provider (PCP) almost twice yearly and the number of visits increases with age.[1] The US Preventive Services Task Force encouraged screening at-risk patients for melanoma.[2] We conducted a randomized trial to assess the efficacy of mastery learning and found that trained PCPs referred significantly more melanomas and less benign nevi and seborrheic keratoses than controls in the 3 months after education.[3] Now, we examine (a) trained PCPs' short-term clinical use of dermoscopy and (b) the electronic medical records (EMRs) of patients of all PCPs for 6-, 9-, and 12-month referrals. Thus, the effect of PCP training on patient outcomes, the third phase of translation science, was assessed.[4]

METHODS

Short-term Dermoscopy of Patients' Pigmented Lesions

After completing the post-test, a research assistant helped the 44 trained PCPs transmit dermoscopic images of lesions and their management decisions to the dermatologist (JKR) with a smartphone equipped with a dermoscope (VEOS DS3 dermoscope, Canfield Scientific, Inc., Fairfield, NJ). Each PCP selected 12 patients deemed at risk for melanoma due to a past history of skin cancer (melanoma and/or nonmelanoma skin cancer), abnormal moles (dysplastic nevi), multiple blistering sunburns, indoor tanning, or a family history of melanoma.[3,4] The PCP screened areas of the body exposed during a problem-focused physical examination (head and neck, arms and hands, and sometimes the chest and back). Deidentified images were transmitted for 2 weeks with (1) a designation of benign or clinically concerning and (2) management recommendations to either reassure the patient or refer to dermatology. The dermatologist (JKR) reviewed the images blinded to the identity of the patient, the PCP, and the PCP's diagnosis and management plan. After the dermatologist entered a diagnosis and management plan, she accessed the PCP's identity, diagnosis, and management plan and sent the PCP an email indicating either agreement or disagreement with the designation and management recommendation. The institutional review board of Northwestern University approved the study with online consent.

EMR Review

The EMR was reviewed for 6-, 9-, and 12-month referrals. The 6- and 12-month follow-ups were chosen based upon the course recommendation to follow concerning lesions for change in 6 and 12 months. Also, the 1-year follow-up assessed melanomas that may have been missed by the PCPs. Since the median growth rate for slow-growing melanomas was 0.12–0.13 mm per month, a 5-mm lesion would increase by 1.44–1.56 mm in 12 months to 6.44–6.56 mm.[5]

RESULTS

Short-term Dermoscopy of Patient's Lesions

Among the 528 images (one image for each of 12 patients of 44 PCPs), the PCP and dermatologist agreed on 450 (85.23%). The agreement did not change during the 2 weeks in which PCPs received comments about their diagnosis and management. There were 71 false positives (13.44%), PCP malignant/dermatologist benign, and 7 false negatives (1.33%), PCP benign/dermatologist malignant. None of the PCPs purchased a dermoscope to continue using it.

EMR Review

In our original study, we randomized 89 PCPs; 44 received mastery training and 45 served as controls. In the year following training, these providers served 144,801 patients that are

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Table 1 Primary Care Physicians' Monthly Referral of Clinically Suspicious Pigmented Lesions

Referral rates (number/1000)	Intervention PCP ($n = 44$)	Control PCP ($n = 45$)
1–3 months		
Overall	29.8	56.1
Seborrheic keratoses	4.9	12.1
Benign nevi	12.4	28.0
Atypical nevi (dysplastic)	11.1	14.6
Melanoma	1.2	1.2
6, 9, and 12 months		
Overall	48.0	64.1
Seborrheic keratoses	10.6	13.8
Benign nevi	18.7	3.0
Atypical nevi (dysplastic)	17.3	2.0
Melanoma	1.3	2.5

predominantly white (87%) and mostly female (68%) with a mean age of 62 among trained PCPs and 51 among controls. Trained PCPs' reduction in seborrheic keratosis referrals post-training was slightly attenuated; however, they had consistently lower benign nevus referrals (Table 1). Controls had higher referrals for both at all assessments. Evaluation at 3, 6, 9, and 12 months after training did not demonstrate an inflection point for changes in referrals. There was no clinically important difference in melanoma between the groups.

DISCUSSION

The trained PCPs maintained fewer benign nevus referrals when compared with controls, but did not maintain the initial notable reduction in seborrheic keratosis referrals. One year may not be long enough to assure that melanomas were not missed. Additionally, the number of subjects was too small to detect differences, especially in melanoma referrals. There may be a need for refresher sessions at regular intervals, as suggested by previous research.[6] If there is a need for dermoscopy to improve accuracy, the fact that no providers purchased one suggests an alternative process is needed to provide them. In future studies, false-negative rate will be assessed by having a dermatologist examine patients.

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Compliance with Ethical Standards:

The institutional review board of Northwestern University approved the study with online consent.

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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