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# Palpation as a useful diagnostic tool for skin lesions



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## KEYWORDS

Pigmented;  
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**Summary** *Introduction:* Early identification and accurate diagnosis of malignant pigmented skin lesions is essential for effective management and cost containment. The aim was to investigate the additional value of tactile descriptive information from lesion palpation on the diagnostic accuracy of pigmented skin lesions by medical students using computer-driven learning. *Methods:* Sixth year medical students ( $n = 152$ ) from the University of Adelaide were invited to participate in an online teaching module on pigmented skin lesions. Users were asked to describe, diagnose and manage 15 pigmented skin lesions in three separate case studies based on pertinent clinical history and visual images of the lesions. Tactile descriptive information was then provided and users were asked to reflect on their diagnosis and management.

*Results:* A total of 66 (43%) of the sixth year students successfully completed the online module. Diagnostic accuracy improved significantly with the provision of tactile descriptive information for seborrhoeic keratosis ( $p = 0.012$ ), basal cell carcinoma ( $p = 0.001$ ), squamous cell carcinoma ( $p = 0.02$ ), and dysplastic naevi ( $p = 0.035$ ). Tactile descriptive information was stated by 23% of medical students to be important in the clinical diagnosis of pigmented skin lesion. Students managed all malignant pigmented skin lesions with either appropriate biopsy or specialist referral.

*Conclusions:* Palpation information about skin lesions offers useful information for improvement of diagnostic accuracy in an online computer learning setting for medical students.

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## Introduction

Australia has the highest incidence of skin cancer in the world with a rising rate of melanoma among the younger population.<sup>1,2</sup> Differentiating benign from malignant pigmented skin lesions can present significant diagnostic difficulty, as lesions often display variable levels of pigmentation and other morphology. It is widely appreciated that experienced clinicians, who employ a wide range of techniques and skills, often demonstrate high diagnostic acumen.<sup>3</sup> With this background in mind, it is of critical importance that medical practitioners have a keen awareness of these conditions and are able to develop the skills to facilitate early diagnosis and appropriate management decisions. In today's environment where increasing numbers of medical graduates have fewer direct interactions with patients, the provision of appropriate useful learning opportunities is a challenging task.<sup>4</sup>

There is increasing interest in innovative teaching techniques with improved validated electronic assessment tools for the diagnosis of skin lesions.<sup>5,6</sup> The basic assessment of skin lesions involving analytical versus non-analytical thinking has been extensively investigated.<sup>4</sup> The "ABCDE" mnemonic for melanoma detection is an example of a useful analytical approach for better pattern recognition.<sup>5</sup> However, a holistic approach taking into account novel details of skin lesion including the use of all diagnostic modalities might be preferable.<sup>3</sup> Electronic assessment tools that are visual and interactive are also essential for improved diagnostic scores among medical students.<sup>7-9</sup>

Palpation is a useful adjunctive diagnostic modality that is seldom mentioned and often undervalued in the assessment of skin lesions.<sup>3,5</sup> Palpation provides information on consistency, quality, temperature, and tenderness. Its haptic properties have been shown to influence psychomotor performance in laparoscopy and improvement in telemedicine assessment of head and neck cancers.<sup>10,11</sup> Computerised analysis of pigmented skin lesions is an evolving area of research aiming to provide diagnostic tactile information from patients in remote areas to clinicians in central hospitals. However evidence for the value of such an approach is inconclusive.<sup>6,12</sup> The absence of this key modality in the context of tele-dermatology has been associated with lower diagnostic accuracy rates and higher need for initial biopsy compared with the assessment of patients with malignant pigmented lesions in the clinical setting.<sup>13,14</sup>

We hypothesised that the addition of tactile descriptive information, obtained by clinicians at the time of skin lesion photography, adds value to the computer-driven diagnostic and management process. Thus the simulation is sufficiently realistic to appropriately supplement the clinical experience.

The current study aims to investigate the additional value of tactile descriptive information from palpation on the diagnostic accuracy of pigmented skin lesions by medical students using computer-driven learning.

## Materials and methods

### Study design

Final (sixth) year medical students from the University of Adelaide were invited to participate in an online teaching

module on pigmented skin lesions. Users were asked to describe, diagnose and manage a total of 15 pigmented skin lesions in three separate parts, based on visual information with pertinent clinical history. Tactile descriptive information was obtained by the clinician through palpation at the time of image capture of each lesion. The tactile information was then provided to students, who were then asked to reflect on their previous diagnosis and management. All selections were recorded. The correct diagnosis and appropriate management of each pigmented skin lesion was not provided to students during the course of this study. Upon completion of the learning module, students were given the opportunity to complete an online questionnaire that evaluated the effectiveness of the module as a teaching-tool and obtained further information on the use of palpation as a diagnostic modality by the students.

### Resource

An online self-assessment module entitled 'Pigmented Skin Lesions: Diagnosis and Management' was published on [www.emedici.com](http://www.emedici.com) with approval obtained from the Human Research Ethics Committee (HREC), University of Adelaide, South Australia, Australia. eMedici<sup>®</sup> is an online learning programme containing open-ended series of case studies covering various aspects of medical practice. Participants accessed the online teaching module (eMedici<sup>®</sup>) using specific user identification details that were later de-identified prior to analysis.

The module contained three parts, with each containing five individual case studies, with each case study based on a clinical image of a pigmented skin lesion. A total of three pigmented seborrhoeic keratoses, three pigmented basal cell carcinomas, three pigmented squamous cell carcinomas, three dysplastic naevi and three malignant melanomas were included in this study. Lesions were randomly allocated to each section. Multiple-choice questions were provided for diagnosis and management. Selection options for diagnosis were: solar keratosis, seborrhoeic keratosis, dysplastic naevus, benign melanocytic naevus, basal cell carcinoma, squamous cell carcinoma or malignant melanoma. Selection options for management were: reassure, reassure and monitor, biopsy, or specialist referral.

Images included in the modules were obtained with informed consent from patients attending outpatient clinics at the Royal Adelaide Hospital and from a senior consultant image databank. Clinical and tactile descriptive information regarding the lesions was recorded. Diagnosis was based either on histological findings for biopsied lesions or clinical judgement by experienced specialists for non-biopsied lesions. Recommended management was based on best practice using the National Health and Medical Research Council (NHMRC) clinical practice guidelines for treatment and management of melanoma and non-melanoma skin cancer in Australia.<sup>19,20</sup>

### Statistical method

The Student's *t* test was used to test score differences for diagnosis (Table 1).

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