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Non-invasive tools for the diagnosis of cutaneous melanoma.

Fink C, Haenssle HA. *Skin Res Technol.* 2016 Nov 22. doi: 10.1111/srt.12350.

ABSTRACT

BACKGROUND: While the excisional biopsy and histological examination of suspicious lesions remains the current gold standard for diagnosing cutaneous melanoma (CM), there is a demand for more objective and non-invasive examination methods that may support clinicians in their decision when to biopsy or not. **METHODS:** This review is based on publications and guidelines retrieved by a selective search in PubMed and MEDLINE and focused on non-invasive diagnostic strategies for detecting melanoma. **RESULTS:** Ten different non-invasive techniques were compared with regard to applicability, status of development, and resources necessary for introduction into clinical routine (dermoscopy, sequential digital dermoscopy, total body photography, computer-aided multispectral digital analysis, electrical impedance spectroscopy, Raman spectroscopy, reflectance confocal microscopy, multiphoton tomography, stepwise two-photon-laser spectroscopy, quantitative dynamic infrared imaging). In an effort to create a classification based on our analyses, we suggest to differentiate i) tools for screening of patients in daily clinical routine, ii) tools for examination of a restricted number of preselected lesions that produce an automated diagnostic score, iii) tools for examination of a restricted number of preselected lesions at specialized centers requiring extensive training, iv) devices at an experimental stage of development. **CONCLUSION:** None of the discussed examination techniques is able to provide a definite and final diagnosis or to completely replace the histopathological examination. Up to date, the need for fully automated devices offering a complete skin cancer screening has not been satisfied. © 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd. **KEYWORDS:** Raman spectroscopy; atypical nevus; computer-aided multispectral digital analysis; dermoscopy; diagnostic devices; dysplastic nevus; electrical impedance spectroscopy; in vivo multiphoton tomography; infrared thermal image analysis; melanoma; reflectance confocal microscopy; sequential digital dermoscopy; stepwise two-photon-laser spectroscopy; total body photography PMID:27878858 DOI:10.1111/srt.12350