Horizon Scan Report 0002 **29 January 2009**

Diagnostic Technology:
Dermoscopy for the diagnosis of melanoma in primary care

Clinical Question: In patients presenting to primary care with suspected melanoma, does dermoscopy increase sensitivity and specificity of melanoma diagnosis compared to simple visual inspection.

Advantages over Existing Technology:
The single most promising strategy to cut the mortality rate from melanoma is early detection (16). Thus far, most skin disease is diagnosed by simple visual inspection and biopsy. Two factors directly influence clinical practice and patient management. Firstly, the ability to correctly identify lesions that have the potential to be melanoma, and secondly, the number of skin excisions performed to confirm diagnosis. Dermoscopy is a very useful technique for the analysis of pigmented skin lesions. It represents a link between clinical and histological views, permitting an earlier diagnosis of skin melanoma. It also helps in the diagnosis of many other pigmented skin lesions which can mimic melanoma, such as seborrheic keratosis, pigmented basal cell carcinoma, haemangioma, blue nevus, atypical nevus and benign nevus. Dermoscopic monitoring of melanocytic lesions increases the likelihood that featureless melanomas are not overlooked and minimizes the excision of benign lesions.

Details of Technology:
The dermatoscope generates a beam of light that falls on the cutaneous surface at an angle of 20°, allowing the visualization of the dermoscopic characteristics resulting from the presence of melanin and haemoglobin in the different skin layers. The usual magnification provided by the dermatoscope is 10-fold.

Patient Group and Use:
- Monitoring of melanocytic lesions
- Diagnosis of melanoma
- Enables the physician to understand naevus morphology beyond what is possible by naked eye examination alone
- Recognition of different populations of naevi characterised by similar morphological patterns and pigment distribution

Importance:
Skin malignancy is an important cause of mortality in the United Kingdom and is rising in incidence every year. Most skin cancer presents in primary care, and an important determinant of outcome is initial recognition and management of the lesion. The NICE guidance on the The management of low-risk basal cell carcinomas in the community reports that 24% of primary-care consultations in England and Wales are related to the diagnosis and management of skin conditions, including skin lesions (1.7%) (15). Data published by Cancer Research UK show that 1,777 people die from melanoma each year and 1,002 of these are men (7). The rate of melanoma in men is rising faster than for any other cancer except prostate. Over the last 10 years melanoma rates in men have increased by 42 per cent as against 48 per cent for prostate cancer. As with many cancer diagnoses, if melanoma is diagnosed early, the survival rates are very good; most stage 1 and stage 2 melanomas can be cured. A recent study on the recognition of skin malignancies showed that GPs in the United Kingdom missed a third of malignancies (8), and one systematic review showed that sensitivity for detection of malignant melanoma was as low as 81% in dermatologists and only 41% in primary care physicians (9).

Previous Research:
The performance of dermoscopy has been investigated by many authors, and two meta analyses have confirmed that its use increases diagnostic accuracy by 5% to 30% compared with clinical visual inspection, depending on the type of skin lesion and experience of the physician (1,2,11). In one multicentre European trial, GPs were given a 1-day training course

in skin cancer detection and dermoscopic evaluation, and were randomly assigned to the dermoscopy evaluation arm or naked-eye evaluation arm. During a 16-month period, 73 physicians evaluated 2,522 patients with skin lesions who attended their clinics and scored individual lesions as benign or suggestive of skin cancer. All patients were re-evaluated by expert dermatologists at clinics for pigmented lesions. Referral sensitivity, specificity, and positive and negative predictive values were 54%, 71%, 11%, and 96%, respectively, in the naked-eye arm, and 79%, 71%, 16%, and 98%, respectively, in the dermoscopy arm. Significant differences were found in terms of sensitivity and negative predictive value (P = 0.002 and P = 0.004, respectively). Histopathologic examination of equivocal lesions revealed 23 malignant skin tumors missed by GPs performing naked-eye observation and only six by GPs using dermoscopy (P = 0.002). The study concluded that the use of dermoscopy improves the ability of GPs to triage lesions suggestive of skin cancer (10). In addition, tools such as a three-point checklist to identify melanoma (asymmetry, atypical network and blue-white structures) and the CASH score (colours, architectural disorder, symmetry, homogeneity/heterogeneity), which can be used in conjunction with dermoscopy, have been developed and validation studies undertaken have showed overall good inter-observer reproducibility (3,4,5).
An alternative to dermoscopy called MoleMate, which uses spectrophotometric intracutaneous analysis (SIAscopy) along with an algorithm specifically developed for primary care, is currently being evaluated in a multicentre randomised controlled trial in the UK and the results of this study will be relevant to the diagnosis of melanoma in primary care (http://www.controlled-trials.com/ISRCTN79932379/)

Cost-effectiveness and economic impact:
There is no published evidence on the cost and cost-effectiveness of the use of dermoscopy for the diagnosis of melanoma in primary care. Although several researchers have alluded to the fact that dermoscopy in routine practice may have major implications in large-scale melanoma screening with a reduction of the dermosurgery workload of false positive lesions, leading to cost savings and less unnecessary morbidity and scarring (12), and may be cost-effective due to the decreased number of excised benign lesions and the early detection of melanomas (13). In terms of patient reported outcomes, a study estimating patients' willingness to pay for handheld dermoscopy, digital dermoscopy and teledermoscopy was reported to be 40% below a hypothetical method promising 100% accuracy yet higher than that reported for naked-eye inspection (14).
Future research is needed to assess whether the use of dermatoscopes in a primary care setting is cost-effective in terms of early detection of melanomas.

Research Questions:
To ascertain the current use of dermatoscopes in GP surgeries.
To test whether the use of dermatoscopes in primary care, along with GP training in identification of skin lesions, is feasible and cost effective.

Suggested next step:
1) Cross sectional study of dermoscopy in primary care.
2) Cost effectiveness analysis of dermoscopy in primary care

Expected outcomes:
Dermatoscopes are easy to use and improve diagnostic accuracy for the detection of malignancies in skin lesions. Training of GPs in recognition of melanomas will facilitate early detection, thereby improving disease outcome.

Policy Context Comments:
There are continuing concerns about cancer recognition within primary care as evidenced by the development of the `National Awareness & Early Diagnosis Initiative` as a key component of the Cancer Reform Strategy. The ongoing RCGP-DH National Audit of cancer diagnosis within primary care and the developing NICE public health guidance on skin cancer might also encourage a focus on newer/alternative approaches to cancer diagnosis within primary care.
In this context dermoscopy (in conjunction with appropriate training and quality assurance) is relevant as a technology designed to enhance the accuracy of melanoma diagnosis within primary care in comparison with existing practice.

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Comments:

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