

A Clinico-Dermoscopic Approach for Skin Cancer Screening

Recommendations Involving a Survey of the International Dermoscopy Society

Giuseppe Argenziano, MD^{a,*}, Jason Giacomel, MBBS^b,
Iris Zalaudek, MD^a, Andreas Blum, MD^c, Ralph P. Braun, MD^d,
Horacio Cabo, MD^e, Allan Halpern, MD^f,
Rainer Hofmann-Wellenhof, MD^g, Josep Malvehy, PhD^h,
Ashfaq A. Marghoob, MD^f, Scott Menzies, MBBS, PhDⁱ,
Elvira Moscarella, MD^a, Giovanni Pellacani, MD^j,
Susana Puig, PhD^h, Harold Rabinovitz, MD^k, Toshiaki Saida, MD^l,
Stefania Seidenari, MD^j, H. Peter Soyer, MD^m, Wilhelm Stolz, MDⁿ,
Luc Thomas, MD, PhD^o, Harald Kittler, MD^p

KEYWORDS

• Melanoma • Skin cancer • Clinical diagnosis • Dermoscopy • Dermatoscopy • Triage

KEY POINTS

- A survey consisting of 29 questions was given to members of the International Dermoscopy Society to investigate clinician perceptions and behavior in approaching patients with skin tumors and to propose an updated system of triage.
- Although 81.7% of the respondents reported using dermoscopy for patients presenting with skin tumors, only 37.4% screened all patients regardless of the presenting condition.

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^a Dermatology and Skin Cancer Unit, Arcispedale Santa Maria Nuova IRCCS, Viale Risorgimento 80, Reggio Emilia 42100, Italy; ^b Skin Spectrum Medical Services, Como, Perth, Western Australia 6152, Australia; ^c Public, Private and Teaching Practice of Dermatology, Konstanz, Germany; ^d Department of Dermatology, University Hospital Geneva, Geneva, Switzerland; ^e Department of Dermatology, Instituto de Investigaciones Médicas A. Lanari, University of Buenos Aires, Buenos Aires, Argentina; ^f Dermatology Service, Department of Dermatology, Memorial Sloan-Kettering Cancer Centre, 160 East 53rd street, New York, NY 10022, USA; ^g Department of Dermatology, Medical University of Graz, Auenbruggerplatz 8, Graz A-8038, Austria; ^h Melanoma Unit, Dermatology Department, Hospital Clinic, Institut d'Investigacions Biomèdiques August Pi i Sunyer and U726 Centros de Investigacion Biomedica en Red de Enfermedades Raras, Instituto de Salud Carlos III, Barcelona, Spain; ⁱ Sydney Medical School, Sydney Melanoma Diagnostic Centre, Royal Prince Alfred Hospital, The University of Sydney, Camperdown, Australia; ^j Dermatology Unit, University of Modena and Reggio Emilia, Modena 41121, Italy; ^k Department of Dermatology, Skin and Cancer Associates, School of Medicine, University of Miami, Miami, FL, USA; ^l Department of Dermatology, School of Medicine, Shinshu University, Matsumoto, Japan; ^m Dermatology Research Centre, Princess Alexandra Hospital, The University of Queensland School of Medicine, Brisbane, Queensland, Australia; ⁿ Clinic of Dermatology and Allergology, Hospital Munich-Schwabing, Munich, Germany; ^o Department of Dermatology, Centre Hospitalier Lyon Sud, Lyon 1 University, Pierre Bénite, France; ^p Department of Dermatology, Medical University of Vienna, Währinger Gürtel 18-20, Vienna 1090, Austria

* Corresponding author. Dermatology and Skin Cancer Unit, Arcispedale Santa Maria Nuova IRCCS, Viale Risorgimento 80, Reggio Emilia 42100, Italy.

E-mail address: g.argenziano@gmail.com

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- The average waiting time for a regular patient consultation exceeded 1 month for 38.1% of the respondents (48.9% of those in public positions).
- More than half of the respondents (57%) performed monitoring in at least 30% of their patients.
- An up-to-date system of triage should be implemented to promote an improved diagnostic accuracy and more timely management of skin malignancy.

BACKGROUND

Skin malignancy is a major global health concern in white populations because of the significant incidence of melanoma and nonmelanoma skin cancer (NMSC) in fair-skinned individuals, coupled with its potential morbidity and mortality. Screening for melanoma in particular is considered challenging for 2 main reasons: the first is related to the potential mortality of melanoma if early recognition and removal is not carried out and the second concerns the high incidence of its benign counterpart, the melanocytic nevus. In some instances, nevi can mimic melanoma in clinical appearance and are present as multiple lesions in many individuals in the population. Consequently, even targeted screening for melanoma involves many patients.

Recently, with heightened emphasis on skin cancer prevention, there has been an increasing congestion of specialist dermatology clinics with patients referred from primary care, requiring assessment of possible skin malignancy. Waiting times for dermatology clinics have consequently usually increased, and dermatologists are faced with the task of assessing numerous referred benign lesions (including seborrheic keratoses, hemangiomas, and benign nevi) in lower-risk patients to detect but a few malignancies.^{1,2} This circumstance places a strain on limited specialist resources and can create a paradoxical and counterproductive situation whereby an early diagnosis becomes increasingly difficult for those patients who actually do harbor a skin cancer.

Dermoscopy has become an important tool in the diagnostic armamentarium of clinicians dealing with skin cancer detection. In the current guidelines for the management of melanoma and NMSC, dermoscopy is mentioned as a useful technique for clinicians screening skin lesions because it can increase diagnostic accuracy and prompt earlier excision. Dermoscopy is also helpful for monitoring multiple pigmented lesions whereby recording digital dermoscopic images over time can provide evidence of significant (suspicious) morphologic change (level IA, grade A).^{3,4} Despite these general recommendations, details

of a rational, stepwise approach integrating dermoscopy into a daily clinical work flow are largely absent. In this context, specific guidelines are needed to optimize the overall process of skin cancer screening.

The main objectives of the present study were twofold: (1) to investigate by questionnaire the attitudes and behaviors of International Dermoscopy Society (IDS) members in approaching patients with skin tumors and (2) to propose an updated, rational system of triage for skin cancer screening, based on current published evidence. The ultimate aim of the latter system of triage is to improve the accuracy of diagnosis of skin malignancy and promote a more timely and effective management of skin cancers by both general/family physicians (GFP) and dermatologists. Where the surveyed behavior of clinicians was found to depart from these evidence-based guidelines, the authors propose addressing these areas of concern through focused physician education campaigns.

METHODS

An e-mail of invitation for the questionnaire-type survey was sent on July 29, 2011 to all 5361 members of the IDS (<http://www.dermoscopy-ids.org>). The objective of the survey was to determine the attitudes and clinical behaviors of the survey participants in approaching patients with skin tumors, including the implementation of dermoscopy in their clinical work. The survey consisted of 29 questions (**Fig. 1**) that had previously been developed and ratified by the executive board members of the IDS. Questions included those inherent to (1) the participant's professional profile; (2) his or her attitudes on patient and lesion selection; (3) the method, waiting time, and outcome of triage; and (4) the methods used during the follow-up examination.

The survey was posted on the IDS Web site and took approximately 10 minutes to be completed. Participants were permitted to respond to the survey anonymously (without logging in) and were prevented from responding to the survey more

1. **Your age**
2. **Sex**
3. **Country**
4. **Qualification:** general/family physician; dermatologist; other medical specialist (specify); nurse practitioner or physician assistant; medical student; other non-medical qualification
5. **In what setting do you see most of your patients?** Private; hospital; academic; referral center (e.g., pigmented lesion clinic, melanoma clinic, etc)
6. **What percentage of your patients ask to be checked for skin tumors?** Less than 10%; 10-30%; 30-50%; more than 50%
7. **What proportion of patients presenting with skin tumors do you examine with dermoscopy?** Basically all of them; about half of them; less than half of them
8. **How long have you been using dermoscopy in your practice?** Less than 1 year; 1-2 years; 3-5 years; more than 5 years
9. **How many patients do you examine per week with dermoscopy?** Less than 10 patients; 10-30 patients; 30-50 patients; 50-100 patients; more than 100 patients
10. **How many new (previously unbiopsied) melanomas do you see per year?** Less than 10 melanomas; 10-30 melanomas; 30-50 melanomas; more than 50 melanomas
11. **Which patients do you examine for skin cancer?** Only patients referred/demanding for a skin check; referred/demanding patients plus those with risk factors for melanoma; basically all patients coming to the office for any medical conditions
12. **Which lesions do you examine with dermoscopy?** Only lesions highlighted by the patient or by another doctor; clinically suspicious lesions selected by you during un-aided visual examination of the skin; almost all lesions (both clinically concerning and random benign-looking lesions)
13. **What instrument do you use mostly at the baseline examination of a new patient?** Hand-held polarized dermatoscope (DermLite or similar); hand-held non-polarized dermatoscope (Heine or similar); both the previous (including DermLite hybrid); digital video camera attached to a computer system (Molemax, Fotofinder or similar); digital photo camera attached to a hand-held dermatoscope
14. **Which instrument do you consider more reliable for the diagnosis at the baseline examination of a new patient?** Hand-held polarized dermatoscope (DermLite or similar); hand-held non-polarized dermatoscope (Heine or similar); both the previous (including DermLite hybrid); digital video camera attached to a computer system (Molemax, Fotofinder or similar); digital photo camera attached to a hand-held dermatoscope
15. **On average how long does it take you to perform a baseline exam on a new patient (excluding the time spent taking patient history, disrobing of the patient, acquiring any images, discussion of findings with patient, and paper work)?** Less than 5 minutes; 5-10 minutes; 10-15 minutes; 15-20 minutes; more than 20 minutes
16. **What is the main benefit of the instrument you use at the baseline visit of a new patient?** Diagnostic reliability; time effectiveness; cost effectiveness; patient satisfaction; reimbursement
17. **Do you have a fast track for seeing patients with concerning lesions who are referred by another doctor or are self-referred?** Yes; no
18. **What is the average wait time for a regular (not referred) patient to see you for the first time?** Less than 1 month; 1-3 months; 3-6 months; more than 6 months
19. **When a patient's skin reveals only a few lesions at the baseline visit, but 1 or 2 of them are atypical (doubtful), what do you usually do?** Recommend excision of the atypical/doubtful lesions; recommend a short-term dermoscopic digital follow-up (2-4 months); recommend a long-term dermoscopic digital follow-up (6-12 months); recommend a non-digital follow-up (clinical follow-up with or without baseline clinical images)
20. **When a patient has many nevi on the skin, what do you recommend?** Recommend excision of all atypical/doubtful lesions (independent of the number of atypical lesions seen); perform a comparison of the lesion's morphology with the morphology of the patient's other nevi and, eventually, recommend excision of the ugly duckling, if present
21. **If you see an atypical/doubtful raised/palpable lesion, what do you recommend?** Recommend excision or follow-up depending on the patient risk factors and number of nevi; recommend excision irrespective of the other patient characteristics
22. **How many of your patients seen at the baseline consultation are scheduled for follow-up?** None; 1-10%; 10-20%; 30-40%; 40-50%; More than 50%
23. **Which patients do you schedule for follow-up?** Patients with multiple nevi or previous skin cancer and/or relevant risk factors; patients with single doubtful lesions (no previous skin cancer nor relevant risk factors); both the above; almost all patients, independent from their risk for developing skin cancer and independent from the number of nevi or their morphology
24. **In patients with multiple nevi (>50) what is the average number of lesions you monitor with digital dermoscopy?**
25. **Which follow-up schedule do you recommend for patients with multiple nevi?** Short-term follow-up (2-4 months); long-term follow-up (6-12 months); a combination of short-term and long-term follow-up
26. **What instrument do you use mostly during the follow-up examination of the patient?** Hand-held polarized dermatoscope (DermLite or similar); hand-held non-polarized dermatoscope (Heine or similar); both the previous (including DermLite hybrid); digital video camera attached to a computer system (Molemax, Fotofinder or similar); digital photo camera attached to a hand-held dermatoscope; both hand-held and digital systems
27. **Which instrument do you consider more reliable for the diagnosis during the follow-up examination?** Hand-held polarized dermatoscope (DermLite or similar); hand-held non-polarized dermatoscope (Heine or similar); both the previous (including DermLite hybrid); digital video camera attached to a computer system (Molemax, Fotofinder or similar); digital photo camera attached to a hand-held dermatoscope; both hand-held and digital systems
28. **On average how long does it take you to perform a follow-up examination (excluding the time spent taking patient history, disrobing of the patient, acquiring any images, discussion of findings with patient, and paper work)?** Less than 5 minutes; 5-10 minutes; 10-15 minutes; 15-20 minutes; more than 20 minutes
29. **What is the main benefit of the instrument you use during follow-up examinations?** Diagnostic reliability; time effectiveness; cost effectiveness; patient satisfaction; reimbursement

Fig. 1. The IDS survey, consisting of 29 questions.

than once (by cookie). Participants were given 30 days to answer, edit, and complete the survey once connected for the first time. Three reminder e-mails were sent 1 month apart to invite additional members to join the survey.

On November 30, 2011 the survey was closed and responses collected on a data sheet. Continuous data are given as mean \pm standard deviation unless otherwise specified. Chi-square tests were used for the comparisons of proportions. All given *P* values are 2-tailed, and a *P* value of less than .05 indicates statistical significance. Ethics committee approval was waived.

RESULTS

Participants General Data

Of the 5361 IDS members invited to join the survey, 1214 registered in 4 months and 1123 were considered eligible because they responded to more than 70% of the 29 questions. The mean age of eligible respondents was 46 years (SD, 11 years) and 563 (50.1%) were women. Participants were from 89 countries, with Australia, Italy, Spain, United Kingdom, United States, Romania, and Brazil being the most highly represented and

accounting for 577 (51.4%) responses. Most of the participants were dermatologists (849, 75.6%); 193 (17.2%) were GFP; and 69 (6.1%) were other medical specialists, nurses, or residents (12, not declared). A total of 562 (50%) participants were in private practice, and 553 participants (49.2%) held public positions (in a hospital, referral center, or academic institution).

Almost half of the participants (*n* = 559, 49.8%) reported that at least 30% of their patients asked to be checked for skin neoplasms, and 81.7% (*n* = 917) declared that they use dermoscopy for basically all patients presenting with a skin neoplasm. Most of the surveyed members (*n* = 591, 52.6%) had been using dermoscopy in their practice for more than 5 years, 54.8% (*n* = 616) used dermoscopy on more than 30 patients per week, and 46.7% (*n* = 525) saw more than 10 new (previously unbiopsied) melanomas per year.

Attitudes on Patient and Lesion Selection

When asked which patients they examine for skin cancer, only 37.4% (*n* = 420) of the respondents declared that they would carry out a formal skin cancer screening examination on all their patients,

regardless of the presenting condition (39.1% of dermatologists and 29% of GFP [$P = .009$], 42.2% in private practice and 32.5% in public positions [$P = .007$]). Five hundred (44.5%) respondents performed a screening examination on patients either referred for or requesting a skin cancer check as well as those with risk factors for melanoma, and 17.4% ($n = 195$) would perform such an examination only for those patients referred for or specifically requesting a skin check.

Most of the participants ($n = 619$, 55.1%) declared using dermoscopy to examine almost all lesions (both clinically suspicious and random, clinically benign-looking lesions) of the given patient (no differences between dermatologists and GFP or between private and public practices), and 42.6% ($n = 478$) examined dermoscopically only clinically suspicious lesions selected during the unaided visual examination of the skin.

Triage Method and Waiting Time

Most of the respondents ($n = 890$, 79.3%) declared using hand-held dermatoscopes at the baseline examination of a new patient, mainly because of their diagnostic reliability. Although only 14.8% of the participants in public positions used digital systems, almost double (25.1%) the number of respondents who operated in private practice used digital dermoscopy ($P = .004$). More than half ($n = 628$, 55.9%) of all respondents declared performing a baseline examination on a new patient in less than 10 minutes, whereas only 6.9% ($n = 78$) required more than 20 minutes. When comparing participants from private versus public practices, 50.5% and 61.7%, respectively, performed an examination in less than 10 minutes, whereas 10.1% and 3.6%, respectively, required more than 20 minutes.

Although most respondents ($n = 776$, 69.1%) reported having a fast-track system for seeing patients with concerning lesions (who are referred by another doctor or are self-referred), the average waiting time for a regular (ie, routine, nonurgent) initial patient consultation was more than 1 month for 38.1% ($n = 428$) of the participants overall (48.9% in public positions and 27.6% in private practice; $P < .001$). Less than 1 month of waiting time was declared by 76.7% of GFP but only by 54.1% of dermatologists ($P < .001$).

Triage Outcome

When a patient's skin revealed only a few lesions at the baseline examination, and 1 or 2 lesions were doubtful (atypical), 90.5% ($n = 1016$) of surveyed members elected to perform excision (45%) or short-term follow-up (45.5%) for such

lesions. When a patient presented with multiple nevi, 91.3% ($n = 1025$) of participants first compared the (clinical-dermoscopic) morphology of these lesions with that of the patient's other nevi and recommended excision of any ugly duckling lesions (no differences between dermatologists and GFP were present or between private and public practices). Only 6% ($n = 67$) of the respondents recommended excision of all atypical/doubtful lesions (independent of the number of atypical lesions seen). If a raised or palpable atypical/doubtful lesion was encountered, 54.9% ($n = 617$) of the respondents recommended excision regardless of the other patient characteristics; but 41.9% ($n = 470$) recommended excision or follow-up depending on the patient risk factors and number of nevi.

More than half of the respondents ($n = 640$, 57%) reported that they would schedule a follow-up for at least 30% of their patients seen at the baseline consultation (62.6% of respondents in private practice and 51.5% in public positions, $P < .001$). When asked which patients they schedule for follow-up, 73.2% ($n = 822$) of the surveyed members declared that they would monitor patients with multiple nevi or previous skin cancer and/or relevant risk factors, patients with single doubtful lesions (no previous skin cancer nor relevant risk factors), or both. Of note, 22.2% ($n = 249$) of respondents would monitor almost all patients independent of their risk of developing skin cancer and independent of the number of nevi or their morphology (28.8% of respondents in private practice and 15.4% in public positions, $P < .001$).

Follow-up Examination

In patients with multiple nevi (>50 lesions), most of the participants ($n = 922$, 82.1%) recommended long-term (6–12 month) follow-up (39%) or a combination of short-term (2–4 month) and long-term follow-up (43.1%). A total of 452 (40.2%) respondents monitored less than 10 lesions per patient with digital dermoscopy, whereas 27.2% ($n = 306$) monitored 10 to 30 lesions, and 25.3% ($n = 284$) monitored most of the patient's lesions. At the follow-up examination of the patient, 47.1% ($n = 528$) declared using hand-held dermatoscopes, 24.7% ($n = 277$) a digital system, and 23.0% ($n = 258$) both hand-held and digital dermoscopy (no differences were noted between dermatologists and GFP or between private and public practices). Performing a follow-up examination took less than 10 minutes, 10 to 20 minutes, and more than 20 minutes for 45.7% ($n = 513$),

39.5% (n = 443), and 10.0% (n = 112) of the respondents, respectively.

DISCUSSION

Skin cancer is a significant worldwide health problem because of its high incidence in white populations, combined with its potential morbidity and mortality. Recently, with increasing emphasis on skin cancer prevention, there has been a progressive inundation of specialist dermatology clinics with patients referred from primary care, requiring assessment of possible skin malignancy. Limited specialist resources have subsequently become overtaxed with many benign lesions in lower-risk patients. This scenario can create a counterproductive situation wherein an early appointment and diagnosis becomes increasingly difficult for other (higher-risk) patients who actually do harbor a skin cancer.

In the United Kingdom, patients referred from primary care with suspected skin cancer (ie, melanoma or invasive squamous cell carcinoma) should be, as a rule, seen at a public hospital dermatology clinic within 2 weeks (and treatment commenced within 62 days).^{1,5} However, the feasibility of this program is challenged by the problems mentioned earlier; in many countries, the waiting time is longer than 1 month. In the United States, for example, patients with a changing pigmented lesion (a possible indicator of malignancy) face waiting times just as long as those for patients with routine complaints (more than 38 days).⁶ In the authors' survey involving 1123 clinicians from 89 countries, the average waiting time for a regular (nonurgent) initial patient consultation was more than 1 month for 38.1% of respondents overall and for about half (48.9%) of the clinicians working in public hospitals.

In the authors' estimation, this difficult situation is not only caused by the increasing demand for skin cancer screening but also stems from several factors currently hampering efficiency in the general clinical approach to patients with skin tumors. By investigating the screening behavior of clinicians particularly devoted to skin cancer detection and after evaluating current published evidence in this field, the authors propose an updated, rational system of triage. The latter primarily aims to improve the accuracy of diagnosis and lead to a more efficient management of skin cancers (particularly melanoma) by both GFP and dermatologists. If it can achieve these objectives, this triage system has the potential to reduce the number of unnecessary referrals of benign skin lesions to specialist dermatology clinics, to decrease the number of unnecessary removals of benign skin

lesions in primary and secondary care, and to reduce waiting times for dermatologic and surgical clinics.

Over the last decade, dermoscopy has been shown to improve the accuracy of diagnosis of a variety of skin lesions over clinical inspection alone.^{7–13} Although largely expected, 81.7% of the surveyed members declared examining all patients with dermoscopy who presented with skin tumors. This finding demonstrates that dermoscopy has become a well-used method in the diagnostic armamentarium of clinicians dealing with skin cancer detection. Current guidelines for the management of melanoma and NMSC cite dermoscopy as a useful tool for clinicians screening skin lesions.^{3,4} Despite this, details of a methodology that integrates dermoscopy into a rational clinical work flow for skin cancer screening are essentially absent, and a proposal for such an integrated clinico-dermoscopic approach is, therefore, presented.

Choice of Dermoscopy Device

To optimize screening, clinicians should be equipped with a manual (hand-held) dermatoscope. These devices are relatively inexpensive optical instruments that are capable of producing high-quality images while also allowing a relatively quick examination for most patients. Regarding the latter, a recent study estimated that the time required to complete a total body skin examination with manual dermatoscopy was in the order of only 2 to 3 minutes.¹⁴ These benefits of hand-held dermoscopy seem to be reflected in the survey results whereby most of the respondents (79.3%) reported using a hand-held dermatoscope at the baseline examination of a new patient, and more than half of all respondents (55.9%) performed a baseline examination on a new patient in less than 10 minutes.

The characteristic ease and rapidity of examination when using a hand-held dermatoscope enables an examination of all lesions by dermoscopy, which is particularly important for diagnosing early melanoma and NMSC. Early melanoma often does not present as an ugly duckling lesion by clinical inspection. These clinically featureless melanomas may be pigmented or non-pigmented and may be small, regular in shape, and/or fairly uniform in color, in effect escaping clinical diagnosis based on the classic ABCD (asymmetry, border, color, diameter) criteria. However, these melanomas frequently have suspicious features on dermoscopy, which permits an early diagnosis.¹⁵ This point should be underlined because only 55.1% of the surveyed members

used dermoscopy to examine almost all lesions of a given patient (both clinically concerning and random, benign-looking lesions), and 42.6% examine dermoscopically only clinically suspicious lesions selected during the unaided visual examination of the skin. The latter method of applying dermoscopy may be effective in reducing the excision of benign (false positive) lesions, thus improving specificity for melanoma detection, but may result in missing early, clinically inconspicuous melanoma (ie, potentially reducing sensitivity for melanoma diagnosis).

In contrast to hand-held dermatoscopes, video dermatoscopes are digital tools that do not generally provide the high image quality required for precision in dermoscopic diagnosis but are very useful for performing digital monitoring of patients with multiple nevi.^{16,17} In effect, they aid in the detection of melanocytic lesions that develop dermoscopic change over time. Of note, video dermatoscopes are usually incorporated into more expensive computerized instrumentation, and nevus monitoring increases the time required for patient assessment.¹⁸ This general concept seems to be reflected in the authors' survey responses. Although only 14.8% of participants in public positions used digital systems, almost double (25.1%) that number of respondents in private practice used digital dermoscopy. When analyzing the time needed to perform a baseline patient examination using any instrument, participants from private practice required a significantly greater amount of time compared with clinicians in public positions.

Improving Patient Selection

In line with previous reports,¹⁹ in the authors' survey, only 37.4% of the respondents performed a general skin cancer examination on all patients presenting to their office for any medical condition. Of the remaining respondents, 44.5% examined patients who were referred for (or who requested) a skin cancer check plus those with risk factors for melanoma, and 17.4% examined only those patients who were referred for (or who requested) a skin cancer check.

As discussed previously, a significant problem of screening for melanoma in the general population is the extremely high prevalence of individuals with melanocytic nevi. Unselected screening of vast numbers of patients in the population is possible but rather difficult with respect to the available resources and cost.²⁰ Targeted screening of higher-risk individuals has, therefore, become advocated.²¹ Opportunistic full skin examinations of higher-risk patients by GFP and

dermatologists may assist in the detection of skin cancer, including melanoma. For example, a US study estimated that more than 60% of patients with melanoma had visited their GFP in the year before diagnosis for problems not related to the skin. Therefore, opportunistic screening of high-risk GFP patients could potentially lead to an earlier diagnosis of such melanoma, with improved prognosis.²² A second point concerns dermatologists: a recent clinical study has calculated that the risk of missing a skin cancer in patients who are seen by a dermatologist for a localized problem (which does not involve examination of the whole cutaneous surface) is in the order of 1 in 50 patients, whereas the risk of missing a melanoma is about 1 in 400 patients.²³

These sobering figures lead us to consider, at least for the specialist, the possibility of offering a total body skin examination to all patients; but if that is not feasible, then it should be offered to patients in the following higher-risk groups:

1. Patients with a personal history of any skin malignancy or a family history of melanoma (in first-degree relatives)
2. Patients younger than 50 years who present with more than 50 nevi in total or more than 20 nevi on the arms
3. Patients older than 50 years who present with evidence of chronic solar damage

This scheme, a modification of a recent French study, may allow a quick and effective selection of patient groups who are at increased risk of melanoma and NMSC.²⁴

Improving Triage Outcome

Once examined clinically and by hand-held (manual) dermoscopy, patients will follow 2 distinct management paths, depending on their risk profile: (1) patients who have a single lesion or few lesions and (2) patients with multiple nevi.

Patients with a single lesion or few lesions

Simply put, if a lesion seems benign it may be left; but if it is suspicious, it should be removed. This approach, although apparently straightforward and obvious, is not so easily applied in daily practice because of the high prevalence of lesions appearing slightly irregular by clinical or dermoscopic examination. Clinicians may choose to monitor such mildly atypical melanocytic lesions in low-risk patients over time; but in the authors' view, monitoring is a specific procedure that helps reduce the number of unnecessary excisions in higher-risk patients, particularly those with multiple nevi (see later discussion). In contrast, for

low-risk patients with a single or a few slightly atypical melanocytic lesions, a simple dichotomous approach (ie, no further examination versus excision) can be adopted. The latter approach has the advantage of prompting the excision of an eventual melanoma as early as possible and to acquire more appointment space for new, higher-risk patients to be screened.

An alternate method to manage indeterminate or equivocal melanocytic lesions is short-term clinical and dermoscopic follow-up.^{17,25} Short-term follow-up is useful in ensuring that the lesion being monitored follows a benign evolutionary course, thus helping to avoid unnecessary biopsy of benign lesions. Conversely, if there is any morphologic change in the lesion after short-term follow-up (generally 2–4 months), then the lesion is removed for histopathologic testing. In this way, short-term monitoring aims to detect early melanoma that may otherwise have been missed. This overall approach seems to be well reflected in the authors' survey, in which 90.5% of respondents reported that they would perform excision or short-term follow-up for single atypical lesions.

Patients with multiple nevi

A patient with multiple nevi is identified by the presence of more than 50 common nevi in total (excluding lentigines or freckles and common nevi less than 2 mm in diameter) and/or the presence of multiple clinically atypical moles. The latter are characterized by their relatively large diameter (>6 mm) and irregularity in shape and color. With or without an additional family history of melanoma, these patients are at a higher risk of developing melanoma and benefit from long-term monitoring of their lesions.

During the initial visit, the patients' nevi are each analyzed with the manual dermatoscope for any suspicious features. This approach is the traditional *analytic* or *morphologic* approach for the dermoscopic diagnosis of melanoma. Next, the predominant dermoscopic nevus pattern of the patients are determined (ie, reticular, globular, or homogeneous dermoscopic pattern or a combination thereof). By recognizing the predominant dermoscopic morphology of the patients' nevi (also called the *signature* nevus pattern), the dermatologist can then identify any possible dermoscopic ugly duckling lesion that differs from the others and, therefore, should be targeted for excision.^{26,27} This approach is the *comparative* dermoscopic approach for diagnosing melanoma. By adding the comparative to the analytic dermoscopic approach for recognizing melanoma, dermoscopists in a recent study were able to reduce the number of unnecessary removals of

benign lesions by approximately 75%.²⁸ In other words, specificity for the diagnosis of melanoma was improved, which the authors found occurred without missing a case of melanoma.

Employment of this comparative approach is confirmed in the authors' survey results, in which 91.3% of the respondents reported performing a comparison of the lesion's morphology with the morphology of the patient's other nevi and subsequently recommended excision of any ugly duckling lesions.

Once the aforementioned process is completed at the first visit, patients with multiple nevi should be included in a long-term clinical and dermoscopic monitoring program for the detection of subsequent melanoma.^{29–33} This procedure is a time consuming but is justified for 2 main reasons: (1) A dermoscopically featureless melanoma, such as an amelanotic/hypomelanotic melanoma or very early pigmented melanoma, may already be present. Such melanomas can be very difficult to diagnose at the initial visit and typically lie covertly among other benign-looking lesions. (2) Patients with numerous nevi have a significant risk of developing a cutaneous melanoma at some subsequent time in their life, and diagnosis at the earliest possible stage (when prognosis is most favorable) is vital. Formal clinico-dermoscopic monitoring of such high-risk patients in specialist care has been shown to result in the diagnosis of thinner melanomas than if patients are left in the community without specific surveillance.³⁴

For patients with more than 50 common nevi and several atypical nevi (but without a family history of melanoma), the risk of developing a primary melanoma is approximately 3%,³⁵ whereas for patients with multiple nevi and a positive family history of melanoma (or previous melanoma), the risk is at least 10%.^{29,33,36} Conversely, the probability of developing melanoma is exceedingly low for monitored patients who exhibit less than 50 nevi and have no other risk factors for melanoma.³⁷

The latter point should be emphasized because most respondents (57%) declared scheduling for follow-up at least 30% of their patients seen at the baseline consultation, and 22.2% scheduled for follow-up almost all patients independent of their risk for developing skin cancer and independent of the number of nevi or their morphology. These high rates of dermoscopic monitoring or follow-up may represent a significant problem inherent to current skin cancer screening practices, which could limit access of other higher-risk patients to screening facilities. In addition, digital follow-up of a few lesions in a given patient with multiple nevi must never replace total

body examination with dermoscopy. As previously reported, up to 30% of melanomas in high-risk patients may develop in unmonitored lesions.³⁵

Before embarking on long-term monitoring, the specialist should first ensure that patients are able to adhere to a strict follow-up regimen. If agreement between the physician and the patient is reached, the long-term monitoring protocol requires an initial (baseline) inspection of all nevi. In addition to this, video dermoscopic recording of a collection of lesions is carried out, usually consisting of those lesions having the most atypical appearance, but small and dermoscopically unremarkable lesions can also be monitored. No data are available concerning the optimal number of lesions to be monitored per patient; but in the authors' survey, 40.2% of the respondents declared performing digital dermoscopic monitoring of 1 to 10 lesions per patient, and 52.5% monitored more than 10 lesions.

This procedure is repeated after a 3-month interval. This first follow-up review facilitates the detection of any changes in the selected existing lesions on short-term video dermoscopic examination. Such changing lesions should be excised for histopathologic examination to exclude melanoma. Of note, patient compliance is typically significantly higher for short-term (2–4 month) as compared with longer-term (6–12 month) reviews.³⁵

Following the 3-month review, if no suspicious lesions are identified, patients should be followed on a 6- to 12-month basis. This approach is reflected in the authors' survey results, in which

82.1% of the respondents recommended long-term follow-up or a combination of short-term and long-term follow-up for patients with multiple nevi. It should be noted that only clinically flat (nonpalpable) melanocytic lesions with a predominantly reticular pattern on dermoscopy are suitable for monitoring. Clinically elevated (palpable) equivocal lesions or those with significant regression (>50% of the area of the lesion), and a predominant globular, starburst, or multicomponent pattern on dermoscopy should not be monitored, as a general rule. The latter is advocated as a safeguard against the possibility of delaying the diagnosis of potentially invasive melanoma, particularly an elevated nodular melanoma with aggressive biologic behavior, or an invasive melanoma undergoing regression. In other words, elevated indeterminate lesions and those demonstrating significant regression should be excised at the outset rather than monitored. Elevated lesions that are clearly benign (eg long-standing, soft dermal nevi or clear-cut seborrheic keratoses) do not require monitoring.

The overall schema detailed earlier (**Fig. 2**) should be strongly emphasized because in the authors' survey, a relatively high percentage of clinicians (41.9%) declared that they would not necessarily excise a doubtful palpable lesion at the outset but that their decision would depend on patient risk factors for skin malignancy and the total nevus count. This practice is a point of concern because it may potentially result in the nonexcision of an aggressive invasive malignancy, such as a rapidly growing nodular melanoma.³⁸

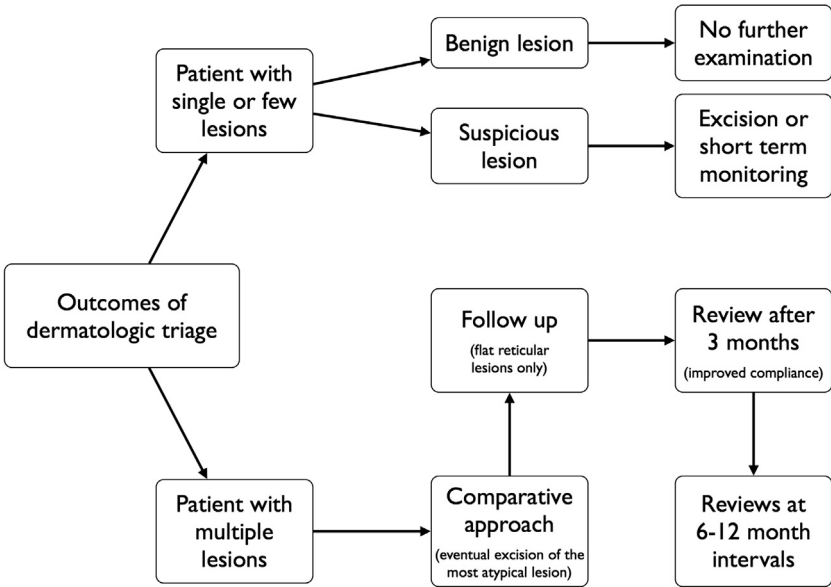


Fig. 2. Work flow summarizing the 2 outcomes of the clinician triage using dermoscopy.

Physician education campaigns could address this issue by focusing on the clinico-dermoscopic recognition and early removal of aggressive skin cancers, particularly nodular melanoma. Regarding the clinical recognition of the nodular melanoma, the EFG mnemonic is a helpful aid and signifies an elevated, firm, and growing lesions present for more than a month.^{39,40} Furthermore, dermoscopic features may be a useful aid to the recognition of nonpigmented and pigmented nodular melanoma; the former often harbors an atypical vascular pattern and remnants of pigmentation,⁴¹ and the latter frequently shows areas of blue and black coloration (which can be coupled with other melanoma-specific dermoscopic criteria).⁴²

In conclusion, despite general limitations of the survey study technique, including a relatively brief questionnaire formulated to encourage a high response rate, the questions and choice of answers being fixed or closed ended, and respondents being unable to explain their responses, and the specific limitation of the preselected profile of the interviewed clinicians (all members of the IDS), this study confirms that dermoscopy is acknowledged and used as a standard skin cancer screening tool. Based on available evidence, up-to-date recommendations for the screening and management (ie, triage) of patients with skin cancer are presented. These recommendations aim to improve the accuracy of diagnosis and promote a more timely and effective management of melanoma and other skin cancers. Areas are highlighted where current (surveyed) clinical behavior departs from these recommendations, and these potential areas of concern could be addressed through focused physician education programs.

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