



# CIGNA MEDICAL COVERAGE POLICY

The following Coverage Policy applies to all plans administered by CIGNA Companies including plans administered by Great-West Healthcare, which is now a part of CIGNA.

**Subject Malignant Melanoma  
Surveillance Technologies**

**Effective Date ..... 11/15/2010  
Next Review Date ..... 11/15/2011  
Coverage Policy Number ..... 0240**

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## Hyperlink to Related Coverage Policies

Mohs' Micrographic Surgery  
Telemedicine

### INSTRUCTIONS FOR USE

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## Coverage Policy

**CIGNA covers dermoscopy (e.g., dermatoscopy, surface microscopy, or digital epiluminescence microscopy [DELM]) as medically necessary for the evaluation of a suspicious pigmented skin lesion.**

**CIGNA covers dermoscopy (e.g., dermatoscopy, surface microscopy, or digital epiluminescence microscopy [DELM]) as medically necessary for surveillance for ANY of the following:**

- personal history of melanoma
- first- or second-degree relative\* with melanoma
- three or more atypical moles (i.e., atypical nevi, dysplastic nevi)

**CIGNA does not cover dermoscopy (e.g., dermatoscopy, surface microscopy, or digital epiluminescence microscopy [DELM]) as a screening test in the general population because it is considered an experimental, investigational or unproven procedure.**

**CIGNA does not cover total-body photography, confocal scanning laser microscopy, ultrasonography, or multispectral imaging for the early detection or monitoring of melanoma because each is considered experimental, investigational or unproven procedures.**

\*A first-degree relative is defined as a blood relative with whom an individual shares approximately 50% of his/her genes, including the individual's parents, full siblings, and children.

\*A second-degree relative is defined as a blood relative with whom an individual shares approximately 25% of his/her genes, including the individual's grandparents, grandchildren, aunts, uncles, nephews, nieces, and half-siblings.

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## **General Background**

The American Cancer Society (ACS) and the National Cancer Institute (NCI) define melanoma as a malignant disease of the skin that may be called cutaneous melanoma or malignant melanoma. Although melanoma accounts for less than 5% of skin cancer cases, it accounts for approximately three-fourths of all skin cancer deaths. Early detection and treatment is the best strategies to reduce the mortality and morbidity associated with melanoma. While there are technologies that may help dermatologists decide whether a lesion should be biopsied, none of these tools can tell the dermatologist if a suspicious lesion is skin cancer; biopsy remains the gold standard.

### **Dermoscopy (Surface Microscopy)**

Dermoscopy, also referred to as dermatoscopy, epiluminescence microscopy, or digital epiluminescence microscopy (DELM), is a noninvasive technique for examining pigmented or nonpigmented lesions to assess anatomic structures that are not visible to the unaided eye. Dermoscopy complements naked-eye clinical examination and may help determine which skin lesions require biopsy or removal. Dermoscopy may be performed by covering the lesion with mineral oil, or it may be performed with the lesion dry. The lesion is examined with magnification (hand lens, dermoscope, or computerized digital imaging). Dermoscopy is typically used on patients who have a pigmented skin lesion (PSL) that is suspected of being melanomas and those who have been referred to a dermatologist for differential diagnosis of the lesions. Some clinicians interpret results while examining the patient; others work from recorded images. Dermoscopic images may be recorded as photographs or slides or digitized. Digitization permits use of various image enhancement and computer analysis techniques, including computer-aided diagnosis. Polarized and nonpolarized dermoscopes are available, and although comparable in their imaging power, certain structures are better seen under different systems.

**Limitations/Concerns:** It is estimated that less than 20% of dermatologists in the United States, and probably even fewer general practitioners and surgeons, use dermoscopy routinely. Dermoscopy is a subjective technique requiring training and experience. For the untrained user, dermoscopy is not advantageous over the clinical examination (Glud, et al., 2009). The evolution of competing dermoscopic algorithms with variable definitions of specific attributes complicates dermoscopic diagnosis. In an attempt at simplification, the Unified Dermoscopy Algorithm International Study is being launched to create a new unified algorithm composed of features that are most discriminatory between nevi and melanoma and have a high inter-observer agreement.

### **Total Body Photography (TBP)**

TBP has been proposed as a screening test, particularly for people at high risk for melanoma. Photographs may be enlarged to show detail of lesions. New photographs can be compared with previous photographs to determine if a lesion has changed. The advent of digital cameras has sparked renewed interest in this technology. Computerized systems for image acquisition and storage are commercially available. Three-dimensional digital photography, currently used in plastic surgery practice, may play a future role in general dermatology practice.

### **Confocal Scanning Laser Microscopy (CSLM)**

CSLM is a device that directs a low-power laser beam onto the skin. As the beam hits the skin, a series of views are collected, assembled, and evaluated using specialized software. The resulting information may help the dermatologist evaluate suspicious lesions and decide if the lesion should be biopsied. This device is not yet widely available (AAD, 2009). CSLM may be used in either reflectance or fluorescence modes. Reflectance Confocal Microscopy (RCM) is a type of confocal microscopy that provides a detailed image of a suspicious lesion. Confocal microscopy is proposed for melanoma diagnosis, preoperative and intraoperative margin assessment, and follow-up for response to medical treatment. According to the AAD, RCM holds much promise as a non-invasive technique, but more research is needed.

## **Ultrasonography**

Ultrasound has been proposed for use in the assessment of skin lesions for melanoma. Reflex Transmission Imaging (RTI) is a type of ultrasound. According to the AAD, its future as a useful tool for detecting melanoma is not clear; more studies are needed.

## **Multispectral Imaging**

Spectral images, ranging from 400 to 1000 nm, provide information on the distribution of collagen, melanin content, and blood vessel distribution within skin lesions. Similar to other technologies above, it is proposed that multispectral imaging may reduce the number of biopsies necessary to rule out melanoma on clinically suspicious yet histologically benign pigmented lesions.

## **U.S. Food and Drug Administration (FDA)**

Examples of initial dermoscopic devices approved by the FDA include:

- Episcope™ (Welch Allyn, Inc., Skaneateles Falls, NY) received approval in 1995 and is intended to illuminate body surfaces and cavities during a medical examination.
- Nevoscope™ (TRANSLITE, Sugar Land, TX) received approval in 1996 and is intended to view skin lesions by either surface illumination or transillumination.
- Dermascope™ (American Diagnostic Corp., Hauppauge, NY) received approval in 1999 and is intended to enlarge images for medical purposes.
- MoleMax™ (Derma Instruments, Vertriebs und Entwicklungs GES.M.) received approval in 1999 and is intended to enlarge images for medical purposes.

In 2004, Visiomed AG (Ft. Lauderdale, FL) received 510(k) approval from the FDA for the MicroDERM® digital dermoscope. It is classified as a Class II device and is indicated for the acquisition and storage of images of skin surfaces which can then be retrieved, printed, reviewed and displayed.

The VivaScope® System (Lucid, Inc., Rochester, New York) received 510(k) approval September 2008, and is a reflectance confocal microscope, full color macroscopic imager, and software intended to acquire, store, retrieve, display and transfer in vivo images of tissue, including blood, collagen and pigment, in exposed unstained epithelium and the supporting stroma for review by physicians to assist in forming a clinical judgment. The VivaScope System does not provide automated analysis or diagnosis of the images it produces.

An example of a spectral imaging device includes the SIAScope II® (Astron Clinica Ltd., Cambridge, UK). It received 510(k) approval September 2007 and uses 'spectrophotometric intracutaneous analysis' (SIAscopy) to identify and display graphically the separate components of the skin. SIAscopy uses a digital camera and light (both visible and near-infrared) to investigate the skin's interior structure. Intended use is The SIAScope is as a non-invasive skin analysis system that shows the relative location of blood, collagen and pigment in color graphical form creating a synthesized image called a SIAscan.

## **Literature Review**

### **Dermoscopy**

Studies suggest clinical examination with the use of dermoscopy is more accurate than naked eye examination alone for discriminating melanoma from non-melanoma in suspicious skin lesions for clinicians with training in dermoscopy.

Vestergaard et al. (2008) conducted a meta-analysis on prospective studies to evaluate the evidence for improved diagnostic accuracy when using dermoscopy in addition to naked eye examination for accurate clinical diagnosis of melanoma. Nine studies met the criteria which included studies that 1) compared diagnostic performance of clinical examination with and without use of dermoscopy; 2) reported sensitivity and specificity for both; 3) compared independently with a valid reference test (histopathological diagnosis or diagnosis made by an expert in the field); 4) performed tests prospectively, independent of and blind to the reference test result; and 5) comprised consecutive patients with a defined clinical presentation. The nine studies included 8487 suspicious skin lesions. Studies performed on images of melanoma were excluded. The summary estimate of sensitivity was higher for dermoscopy (90%) than for naked eye examination alone (71%); specificity for dermoscopy was 90% and naked eye examination was 81%. When two studies with extreme values based on very small numbers of cases of disease were removed from the analysis, the summary estimate of sensitivity

was higher for dermoscopy (87%) than for naked eye examination alone (69%); specificity for dermoscopy 91% and naked eye examination 88%. The authors stated that their summary of sensitivity and specificity showed a statistically significantly higher sensitivity for dermoscopy compared with naked eye examination without decrease of specificity. The authors concluded that dermoscopy improves the ability to detect melanoma without increasing the number of false-positive benign lesions.

Argenziano et al. (2006) conducted a randomized study to demonstrate whether the addition of dermoscopy improved primary care physicians' (PCP) accuracy in triaging lesions suggestive of skin cancer. PCPs (n=73) participated in a one-day training course in skin cancer detection and dermoscopic evaluation. They were then randomly assigned to the dermoscopic arm or naked eye evaluation arm of the study. Over a 16-month period, 2548 skin lesions (2522 patients) were scored as benign or suggestive of skin cancer. The patients were then evaluated and scored by two expert dermatologists who were blinded as to which arm of the study the patients were part of. Because the aim of the study was to verify the ability of PCPs to identify lesions suggestive of skin cancer for referral for a second expert opinion, the evaluation performed at pigmented lesion clinics was chosen as the gold standard. Referral accuracy (in terms of sensitivity, specificity, and positive and negative predictive values) was thus calculated on the basis of contingency tables between outcomes (banal/suggestive of skin cancer) of PCP diagnoses and outcomes (excision yes/no) of diagnoses by experts at the pigmented lesion clinics. In the naked eye arm, referral sensitivity, specificity, and positive and negative predictive values were 54.1%, 71.3%, 11.3% and 95.8%, respectively, and 79.2%, 71.8%, 16.1% and 98.1%, respectively, in the dermoscopy arm. The number of lesions falsely assessed as suspicious by PCPs was responsible for the relatively low positive predictive value achieved by PCPs in both arms. The authors state that by adding dermoscopy to the standard clinical examination, PCPs achieved significantly better referral sensitivity (from 54.1% to 79.2%;  $p=.002$ ). The latter result occurred without a decrease in specificity (71.8%), suggesting that better triage of possible malignant skin tumors could occur without increasing the number of unnecessary expert consultations.

In an ECRI Evidence Report (June 1, 2004) entitled *Dermoscopy for the Diagnosis of Melanoma and Other Forms of Malignancy*, the following conclusions were drawn:

- Dermoscopy is capable of diagnosing melanoma in suspicious pigmented skin lesions. Based on meta-analysis of clinical study results, ECRI estimates the sensitivity of dermoscopy (by itself, not in combination with clinical examination) to be 87.8% and the specificity to be 84.5%. The test is not invasive, so it poses no direct safety risks. The evidence supporting this conclusion is strong. Twelve studies met the inclusion criteria for assessing how well dermoscopy could diagnose melanoma, a total of 3,544 patients.
- Dermoscopy is more effective than visual clinical examination for the diagnosis of melanoma in suspicious pigmented skin lesions, and the combination of dermoscopy and clinical examination is more effective than clinical examination alone. The evidence supporting these conclusions is weak. Five studies met the inclusion criteria for comparing dermoscopy with visual clinical examination for diagnosing melanoma. They included a total of 1,180 patients.
- ECRI searches identified no direct evidence on the effect of dermoscopy on patient quality of life or survival.

In a prospective cohort study, van der Rhee et al. (2010) evaluated 209 suspicious lesions from consecutive dermatology clinic patients. Pathology was used as reference diagnosis. Results showed sensitivity and specificity increased after addition of dermoscopy to the naked eye examination, although neither statistically significantly.

In a longitudinal cohort study, 100 patients underwent baseline DELM and annual imaging of atypical nevi with a median follow-up of 36.2 months (Robinson and Nickoloff, 2004). Clinical inclusion criteria for DELM were 50 or more melanocytic nevi with at least one nevus measuring 8 mm or more in diameter, a personal or family history of a melanoma in a first- or second-degree relative, and at least three clinically atypical nevi with three of the ABCD criteria found in melanoma: asymmetry, color variation over the surface of the nevus (irregular pigmentation), and hazy or irregular borders. All clinically atypical nevi 3 mm or more in diameter and selected common nevi greater than 5 mm in diameter were electronically archived. At the annual examination, nevi were examined by DELM and the images were stored. New nevi greater than 3 mm in diameter were added to the patient's total images. The dermatologist performed online side-by-side comparison of DELM images at each follow-up visit of the respective patient for each lesion on file and made clinical decisions about performing a biopsy. During this study, 3482 nevi were monitored for at least 12 months, and 193 underwent biopsy for

change. Thus, 5.5% of the pigmented lesions demonstrated changes on DELM and were excised. There were no significant differences in the rate of biopsy among the three categories of risk: personal history of melanoma; family history of melanoma in one first-degree relative; and family history of melanoma in two or more first-degree relatives. The authors concluded that Digital ELM, a technologically sophisticated method of surveillance, is optimally used to follow individuals with a personal or family history of melanoma, multiple nevi, and some nevi having the pathological finding of dysplasia.

Haenssle et al. (2004) reported data collected during three years of surveillance of 212 high-risk patients. The median age was 34 years and the median surveillance time 18 months. Follow-up was scheduled for every six or 12 months, or, in case of patients with familial atypical mole and multiple melanoma syndrome (FAMMM) syndrome, every three months. A total of 212 patients were stratified into three groups: Group I included patients with more than 50 common nevi or three or more clinical atypical nevi (n=151); Group II included patients with atypical mole syndrome (AMS) characterized by three or more histologically dysplastic nevi in their personal medical history (n=55); and Group III, which included patients with familial atypical mole and multiple melanoma syndrome (FAMMM), characterized by a family history of at least two melanomas in first- or second-degree relatives (n=6). The two first risk groups were further subdivided according to a positive or negative personal or family history of melanoma. At the first visit, the whole integument was examined by the unaided eye, the number of nevi (<50, 50–100, >100) was estimated, and an ELM examination of all the nevi was performed. Lesions presenting clinical criteria of atypia (asymmetry in shape, variegated color) or ELM criteria of atypia were marked on digital overview images and then electronically stored using a DELM-imaging system and software. The median number of DELM-documented lesions per patient visit was 14, and a total of 2939 melanocytic skin lesions were followed by DELM. Out of these lesions, 112 (3.8%) were excised because of changes that had been exclusively documented by DELM during follow-up. The authors state the proposed combination of conventional photography, ELM and DELM offers a highly effective screening and follow-up strategy for patients at high risk of developing melanoma. This approach should be limited to a patient population at increased risk of melanoma. In addition, significant expertise is necessary for selecting the lesions to be digitally stored and for the subsequent comparative analysis of digitalized epiluminescence microscopic images.

Carli et al. (2004b), in a retrospective review, analyzed the impact of routine dermoscopy on the malignant/benign ratio in excised melanocytic lesions. Pre-operative and histological diagnosis of 3053 melanocytic lesions (319 melanomas) consecutively diagnosed between the years of 1997–2001 were included. The six dermatologists involved were divided into two groups: dermoscopy users (n=2) and non-users (n=4). During this timeframe, the malignant/benign ratio in the users group significantly improved from 1:18 to 1:4.3 (p=0.037). The authors reported no significant difference in the nonusers group during the same time period. The malignant/benign ratio continued to improve in dermoscopy users year by year; although the difference between the users and nonusers was significant in the year 2001 only (p<0.001). Those who used dermoscopy had an average of 63.9% sensitivity and 95.7% specificity, whereas the nonusers had an average sensitivity of 50.7% and a specificity of 97.3%. According to the authors, the difference between these two groups did not reach statistical significance. The authors stated their study demonstrated a more effective preselection of lesions submitted to surgery: the malignant/benign ratio among excised lesions improved in dermoscopy users in the study period, while no change was found for nonusers. Lesions excised by users were more likely to be a melanoma than those excised by nonusers (odds ratio 1: 55). The authors concluded that the adoption of dermoscopy as a second level examination by dermatologists examining pigmented skin lesions is associated with a significant effect on the lesion's management. The authors noted that dermoscopy users experienced an improvement of the malignant/benign ratio in excised lesions through a reduction of the excision of histologically banal—although possibly atypical by naked eye examination—melanocytic nevi.

Carli et al. (2003) conducted a nonblinded case study to evaluate whether and to what extent the use of dermoscopy (i.e., epiluminescence microscopy, dermoscopy) decreased false-positive lesion identification. In a pigmented lesion clinic, 133 patients with lesions defined as suspicious or equivocal on visual exam were reviewed with dermoscopy. Lesions that were still deemed suspicious were excised. Of 2542 pigmented lesions, 43 were suspicious upon visual examination, and 13 were suspicious when viewed with dermoscopy. Subsequent excision of the latter 13 suspicious lesions revealed three malignant melanomas. The authors reported that the use of dermoscopy as a second level examination decreased the number of false-positive results. This resulted in an overall increase in specificity from 98.4% in the clinical examination group to 99.6% in the clinical examination group plus dermoscopy and an increase in positive predictive value from 6.9% to 23% in each group, respectively. At four-year follow-up, no malignancies were found in any of the 30 lesions deemed

not suspicious by dermoscopy. This data suggests that the addition of dermoscopy to conventional visual examination may increase the specificity of melanoma screening.

Kittler et al. (2002) conducted a meta-analysis on the diagnostic accuracy for melanoma, including studies that report sufficient data for sensitivity and specificity. There were 27 studies (9821 pigmented skin lesions) included in the meta-analysis. Estimates of sensitivity and specificity were obtained from each study and used to calculate their log odds ratio, which measures how well the test discriminates between melanoma and non-melanoma. The diagnostic accuracy for melanoma was significantly higher with dermoscopy than without this technique (log odds ratio 4.0 versus 2.7; an improvement of 49%,  $p = 0.001$ ). The diagnostic accuracy of dermoscopy significantly depended on the degree of experience of the examiners. The authors concluded that dermoscopy improves the diagnostic accuracy for melanoma in comparison with inspection by the unaided eye. However, dermoscopy requires sufficient training and cannot be recommended for untrained users. A consensus diagnosis involving two or more experts is recommended to yield the highest possible diagnostic accuracy.

### **Total Body Photography**

Risser et al. (2007) conducted a retrospective study to determine the effect of total body digital photography (TBDP) on biopsy rates in patients with multiple atypical nevi. A total of 128 patients were included in the study and were divided into two groups: those who did not have TBDP ( $n=64$ ) and those who did ( $n=64$ ). The mean number of biopsies performed within the first year of care for those who did not receive TBDP was equal to the mean number of biopsies performed on patients who did receive TBDP (0.82 and 0.8, respectively). There was no statistically significant difference in the median number of biopsies performed between the two groups ( $p=.43$ ). In the group that did not receive TBDP, 26 dysplastic nevi and three melanomas were diagnosed in 19 patients. In the TBDP group, 25 dysplastic nevi and no melanomas were diagnosed, which demonstrated no statistical significance ( $p=.5$ ). This study suggested that the use of TBDP did not impact the number of biopsies performed or the number of dysplastic nevi diagnosed during a one-year period.

A randomized trial including 100 patients at high risk for melanoma (five or more clinical dysplastic/atypical nevi) had baseline whole-body digital photography as part of their clinical examination. Self-administered questionnaires were provided at three intervals: baseline, post-teaching intervention, and at the 4-month post-baseline visit. The patients were randomized to receive educational intervention with a personal photo book or to receive educational intervention alone. The increase in reported skin examination was compared between the two groups ( $>51\%$  v  $>17.6\%$ ,  $p=0.001$ ). The authors state a brief nurse-delivered intervention is effective at increasing patient adherence with skin self examination. A major limitation of this study was the short duration of follow-up (four months) and the potential for the intervention effects to degrade over time (Oliveria et al., 2004).

Feit et al. (2004) evaluated the utility of total cutaneous photography in 12 patients with melanoma. Nine (75%) had past personal history of malignant melanoma, four (33%) had family history of malignant melanoma, and three (25%) had both. All had a history of dysplastic nevi. Median time from photography to first photographic diagnosis of melanoma was 18 months, and median time between photographs and all melanomas was 25 months. A total of 93 biopsies were done and included 77 suspicious melanocytic lesions and 16 suspicious keratinocytic lesions. Authors stated that they were not able to demonstrate that the use of TBDP in patients at high risk for melanoma has an impact during a 1-year study period on the total number of biopsies or the number of dysplastic nevi diagnosed in patients. The authors noted that one year may not be enough time for the TBDP to detect morphologic change of atypical nevi, given that many melanomas are slow growing. The most significant factor predicting biopsy number included the interaction of having a personal history of melanoma and a personal history of severe dysplastic nevi.

### **Confocal Scanning Laser Microscopy (CSLM)**

There have been a number of studies that have evaluated the accuracy of CSLM in assessing skin lesions for melanoma. These studies have reported the sensitivity, specificity, positive and negative predictive values of CSLM in detecting melanoma can range from 90.74% to 97.5%, 83% to 99%, 70.6% to 97.5%, and 98.17% to 99%, respectively (Gerger, 2008; Langley, 2007; Gerger, 2006). In one study, the sensitivity, specificity, positive and negative predictive values of CSLM were compared to dermoscopy and reported as 97.3%, 83.0%, 70.6%, 98.6% and 89.2%, 84.1%, 70.2%, and 94.9%, respectively (Langley, 2007). The researchers found this data encouraging but stated that while CSLM may be a promising method of detecting melanoma in the future, further well-designed studies are needed to confirm these results and to address technological issues such as

the learning curve and the limited penetration depth of the microscope (Gerger, 2008; Langley, 2007; Scope, 2007; Gerger, 2006; Marghoob, 2005).

### **Ultrasonography**

Rallan et al. (2007) conducted a prospective study to determine if high-resolution ultrasound reflex transmission imaging (RTI) could differentiate common benign pigmented lesions (BPLs) from melanoma. RTI is used to determine the lesion attenuation properties. The study also assessed if other parameter could assist in this determination, specifically the "lesional backscatter image" (LBI) which depicts intralesional sound reflection characteristics and the "entry echo image" (EEI), which depicts surface sound reflectance characteristics. Twenty-five malignant melanomas (MM) and 62 noncancerous lesions, as classified by a dermatologist, were analyzed by RTI. Of the noncancerous lesions, 24 were seborrheic keratosis (SK) and 38 were BPLs. When the sensitivity of diagnosing melanoma was set at 100%, RTI, LBI, and EEI were compared in the diagnosis of SK. A total of nine of the 24 SK were detected by RTI and LBI for a specificity of 38%. EEI detected seven out of 24 for a specificity of 29%. Each of the three methods was compared in its ability to diagnose BPLs (with sensitivity set at 100%). The specificity of EEI, LBI, and RTI were 30%, 15%, and 10%, respectively. This study suggests that acoustic differences seen on ultrasound may aid in differentiating common BPLs from MM; however, larger, prospective studies, conducted on a wider range of pigmented lesions, are warranted.

### **Multispectral Imaging**

In a blinded comparison study, Friedman et al. (2008) assessed the sensitivity of dermoscopists in diagnosing small melanomas ( $\leq 6$ -mm diameter) compared with an automatic computer-vision system. This study included pigmented skin lesions from the digital dermoscopic database acquired by Electro-Optical Sciences Inc for the development and testing of MelaFind (Electro-Optical Sciences Inc, Irvington, New York), a multispectral digital dermoscope computer-vision system for early detection of melanoma that is undergoing clinical testing. There were 990 (50% of the total) small lesions, of which 49 were melanomas; thus, 24% of all malignant melanomas were small. All 49 small malignant melanomas were included in this study. Fifty randomly selected nonmelanomas from 46 patients served as a control. Ten dermoscopists independently examined dermoscopic images of 99 pigmented skin lesions and decided whether they identified the lesions as melanoma and whether they would recommend biopsy to rule out melanoma. To determine diagnostic performance, each reader had to answer the following question: "Is this lesion a melanoma?". Individual responses were then compared with the histopathologic diagnosis, which served as the reference standard for the determination of the diagnostic sensitivity and specificity for each reader. Additionally, the readers were asked to answer the following question: "Would you biopsy/excise this lesion?". If the answer was yes, the readers had to specify the reason for biopsy. As with evaluation of diagnostic performance, histologic diagnoses were used as the reference standard to evaluate lesion management decisions. The authors stated that although the average diagnostic sensitivity for all 10 dermoscopists was only 39%, the average biopsy sensitivity was 71%. A similar disparity was seen between the average diagnostic and biopsy specificities of 82% and 49%, respectively. Despite the high biopsy sensitivity of the readers, nearly 30% of melanomas smaller than 6 mm would not have been biopsied. The authors conclude that the addition of such diagnostic tools limit the number of biopsies necessary to rule out melanoma on clinically suspicious yet histologically benign pigmented lesions.

In a prospective blinded study, Glud et al. (2009) included 83 lesions where the diagnosis of melanoma could not be excluded on clinical investigation, from 65 patients referred for excision biopsy of pigmented lesions. Dermoscopic and SIAscopic images (SIAscope II; Astron Clinica, Cambridge, UK) were both obtained. The dermoscopic images were examined by an experienced dermatologist without the knowledge of the SIAscopic or histopathologic diagnoses. The SIAscopic images were evaluated by the proprietary algorithm (using Australian Score System and dermal melanin) developed to differentiate between benign and malignant skin lesions. The results were as follows: The sensitivity of dermoscopy, Australian Score System, and dermal melanin was 0.92, 1.00, and 1.00, respectively. The specificity of dermoscopy, Australian Score System, and dermal melanin was 0.82, .59, and .39, respectively. The positive predictive value of dermoscopy, Australian Score System, and dermal melanin was 0.46, .29, and .22, respectively. The negative predictive value of dermoscopy, Australian Score System, and dermal melanin was 0.98, .98, and 1.00, respectively. The authors concluded that results do not support the use of this version SIAscopy apparatus for the routine screening of melanocytic lesions. This study did not provide total SIAscope values to compare to dermoscopy.

### **Combined Technologies**

Banky et al. (2005) reported on 309 patients referred to a dermatologist for clinical examination who had at least one of the following risk factors for melanoma: four or more clinically dysplastic nevi, 100 or more melanocytic

nevi, a personal history of melanoma, or a family history of melanoma. Individuals with one of these risk factors underwent total body photography. Biopsy specimens were not obtained of all changed and new pigmented lesions. If melanoma could not be confidently excluded by clinical examination and dermoscopy, an excisional biopsy was performed. The median number of follow-up visits following photography was 3. The median length of follow-up was 34 months. A total of 311 changed nevi and 262 new pigmented lesions were detected. Eighty-six nevi regressed completely. Eighteen melanomas were detected in 16 patients. The authors stated that the benign-malignant ratio of lesion biopsy specimens was almost 3:1; noting this ratio compares with a previous study conducted in the same private practice, in which the benign-malignant ratio was 9:1. The authors note that the lower ratio in this more recent study can be explained by the fact that dermoscopy was used in addition to photography. The authors also reported that patients younger than 50 years had a lower incidence of melanomas and a higher rate of new, changed, and regressed nevi when compared with patients older than 50 years. A new or changed pigmented lesion is more likely to be a melanoma in patients older than 50 years. The authors conclude that using baseline total body photography and dermoscopy to monitor pigmented lesions greatly reduces the normally high biopsy rates required to evaluate high-risk patients.

Carli et al. (2004a) conducted a randomized, controlled trial to evaluate the impact of dermoscopy on lesion management. A total of 913 patients with pigmented lesions were randomized to one of three arms of the study: conventional naked eye examination or control group (with mandatory excision of equivocal lesions) (group A; n=302); combined naked eye and hand-held dermoscopy examination (with mandatory excision of equivocal lesions) (group B; n=311); and combined examination with the possibility of digital follow-up according to the physician's decision (group C; n=300). The primary objective involved comparison between groups A and B. Dermoscopy was used to examine pigmented skin lesions classified as suggestive or equivocal by naked eye examination in 158 of 311 (50.8%) patients of group B. After dermoscopy, 17.8% (28 of 158) were classified as harboring suggestive or equivocal lesions and referred to operation according to the study protocol. Therefore, the percentage of patients eventually selected for excisional biopsy in group B was 9.0% (28 of 311), significantly lower than the percentage in the control group without dermoscopy (15.6%; 47 of 302) ( $p=.013$ ). Age showed a statistically significant and independent effect with a 3% increase in the risk of excision for each year of increase in age. In addition, the presence of atypical nevi represented a significant risk factor for surgical excision of suggestive lesions. The authors stated that their study demonstrated that the addition of dermoscopy to routine melanoma screening is associated with clinically relevant effect in the management of lesions, reducing the percentage of cases submitted to excisional biopsy. If storage and retrieval of images is available, about half of dermoscopically equivocal lesions are customarily submitted to digital follow-up instead of to excision. The authors concluded that unfortunately, the occurrence of melanomas left unexcised in this group cannot be ruled out.

Lucas et al. (2003) conducted a retrospective, blinded study of lesions that had been removed from patients during a follow-up that included total-body photography. The purpose of this study was to assess the combination of dermoscopy for identification of nonuniform surface detail and growth on the basis of total body photos. For this study the authors used photographic archives of lesions removed during follow-up of patients with total body photos for which dermoscopic and clinical photos were available. In all, 169 melanocytic lesions were studied, along with their photographic histories. Three academic dermatologists were asked to determine 1) if the lesion was uniform based on a dermoscopic image; and 2) if the lesion had changed based on a side-by-side comparison of a digital clinical image taken before excision and a cropped baseline digital total body photo of the area, and whether it indicated melanoma growth in normal skin or within a nevus. The predicted odds of melanoma for lesions scored as both nonuniform and changed was 4.06 ( $p>.0195$ ). The majority of the lesions in the study set were graded as changed. For the lesions graded as changed, there was a clear segregation of the melanomas to the nonuniform subgroup of 80%. The authors stated that their focused approach on only nonuniform and growing lesions would result in less than 0.1 biopsies per patient year and would result in the detection of 100% of the superficially invasive melanomas and 64% of the in situ melanomas on the basis of their data set. The authors concluded that dermoscopic nonuniformity and change suggestive of growth as determined from total body photos discriminates a subset of lesions that are at high risk for melanoma.

Bono et al. (2002) conducted a prospective study which compared the diagnostic ability of clinical examination, dermoscopic examination, and computerized telespectrophotometric system (TS) examination on a series of consecutive pigmented lesions scheduled to undergo surgery. The study involved 298 consecutive patients with 313 suspicious pigmented lesions, of which 66 were cutaneous melanomas (CM) and 247 were non-melanoma lesions. All 313 lesions were evaluated by each of the diagnostic tools and compared to histology. Naked

eye/clinical examination demonstrated a sensitivity and specificity of 86% and 77%. Dermoscopy sensitivity and specificity were 91% and 74%. TS sensitivity and specificity were 80% and 49%. These differences were not sufficient to obtain a statistical significance between clinical and dermoscopic evaluations ( $p=0.22$ ), whereas there was a significant difference comparing both clinical and TS evaluations ( $p<0.01$ ) and dermoscopic and TS evaluations ( $p<0.01$ ). Combining clinical and dermoscopic evaluations, 64 of the 66 CM were recognized, with a resulting sensitivity of 97%. The addition of TS did not change this figure. The authors concluded that clinical examination coupled with dermoscopy by properly trained clinicians is the diagnostic cornerstone of the early diagnosis of melanoma.

In a prospective trial, Goodson et al., (2010) sought to determine whether biopsy rate, rate of melanoma detection, and melanoma derivation (nevus derived versus de novo) differed, using total body and DELM photography. In a previous study, Goodson monitored 5,945 lesions on 297 patients at risk for melanoma using serial DELM photography. Although a low biopsy rate (1.1 biopsies per patient over a 4.5-year period) was achieved, only one in six melanomas detected on follow-up was biopsied because of photographic change, whereas the remaining melanomas arose de novo or from clinically nonsuspicious nevi not initially photographed. In this comparative trial, a total of 889 new patients and 187 established patients included those having one or more of the following melanoma risk factors: three or more clinically atypical nevi, more than 50 nevi, personal history of melanoma, and two or more family members with history of melanoma. The patients underwent total body photography and were monitored using photographs obtained at the initial visit. Risk factors and median monitoring periods for these patients were comparable with those of patients previously monitored using DELM photography. A total of 275 biopsies were performed on 467 patients on follow-up visits. The authors cited low biopsy rates on follow-up visits with both approaches (0.59 biopsies per patient with total body photography versus 1.1 per patient with DELM photography, statistically significant). The significantly higher biopsy rate with DELM photography may be a consequence of the greater sensitivity for detecting morphologic changes in nevi because of higher resolution of these photographs and the fact that we were more likely to biopsy lesions exhibiting photographic change. The authors stated that total body photography appears to have advantages over serial DELM photography; it is more time efficient and is associated with lower biopsy rates and higher melanoma detection rates. Its greatest limitation appears to be patient adherence to timely follow-up examinations.

### **Professional Societies/Organizations Screening**

The U.S. Preventive Services Task Force (USPSTF) Screening for Skin Cancer Recommendation Statement (revised 2009) comments are limited to skin examination by a primary care clinician or patient skin self-examination. Additionally, their recommendation “the current evidence is insufficient to assess the balance of benefits and harms of screening for skin cancer”, applies to the adult general population without a history of premalignant or malignant lesions.

### **Melanoma Risk**

**The National Comprehensive Cancer Network® (NCCN®):** The NCCN Clinical Practice Guidelines in Oncology™ for Melanoma (v.2.2010) state that risk factors for melanoma include a positive family history of melanoma, prior melanoma, multiple clinically atypical moles or dysplastic nevi, and inherited genetic mutations. In addition to genetic factors, sun exposure may also contribute to the development of melanoma. Individuals with an inability to tan and fair skin that sunburns easily have a greater risk of developing melanoma. However, melanoma can occur in any ethnic group and also in areas of the body without substantial sun exposure.

**National Cancer Institute:** According to the National Cancer Institute (NCI), individuals with certain types of pigmented lesions (dysplastic or atypical nevi), with several large nondysplastic nevi, with many small nevi, or with moderate freckling have a twofold to threefold increased risk of developing melanoma. Individuals with familial dysplastic nevus syndrome or with several dysplastic or atypical nevi are at high (>fivefold) risk of developing melanoma (Gandini, et al., 2005; National Cancer Institute [NCI], 2010).

### **Summary**

Published studies demonstrate that dermoscopy has a statistically significant higher sensitivity than naked eye examination compared with histology, without a decrease of specificity. More accurate triage of suspicious skin lesions without increasing the number of unnecessary biopsies would most benefit individuals at high risk of melanoma. There is insufficient evidence in the published, peer-reviewed scientific literature to support the clinical utility of total body photography, confocal scanning laser microscopy (CSLM), ultrasonography and

multispectral imaging for the early detection or monitoring of melanoma. The accuracy of these technologies compared to unaided-eye examination alone has not been proven through well-designed trials. Although the evidence supporting the use of CSLM for the assessment of skin lesions for melanoma appears promising, further evidence from well-controlled trials is needed to properly evaluate the most beneficial technology for use in clinical practice.

Therefore, the role of dermoscopy in the general population, as well as the role of total body photography, CSLM, ultrasonography and multispectral imaging in any population for the early detection or monitoring of melanoma, has not yet been established.

## Coding/Billing Information

**Note:** This list of codes may not be all-inclusive.

**Covered when medically necessary when used to report dermoscopy (dermatoscopy, surface microscopy or digital epiluminescence microscopy [DELM]) per the criteria indicated in this policy:**

CPT®*	Description
96999	Unlisted special dermatological service or procedure

ICD-9-CM Diagnosis Codes	Description
172.0	Malignant melanoma of skin of lip
172.1	Malignant melanoma of skin of eyelid including canthus
172.2	Malignant melanoma of skin of ear and external auditory canal
172.3	Malignant melanoma of skin of other specified parts of face
172.4	Malignant melanoma of skin of scalp and neck
172.5	Malignant melanoma of skin of trunk, except scrotum
172.6	Malignant melanoma of skin of upper limb, including shoulder
172.7	Malignant melanoma of skin of lower limb, including hip
172.8	Malignant melanoma of other specified sites of skin
172.9	Melanoma of skin, site unspecified
216.0-216.9	Benign neoplasm of skin
V10.82	Personal history of malignant melanoma of skin
V16.8	Family history of other specified malignant neoplasm

### Experimental/Investigational/Unproven/Not Covered:

CPT®*	Description
96904	Whole body integumentary photography, for monitoring of high risk patients with dysplastic nevus syndrome or a history of dysplastic nevi, or patients with a personal or familial history of melanoma

ICD-9-CM Diagnosis Codes	Description
	All other codes

\*Current Procedural Terminology (CPT®) © 2010 American Medical Association: Chicago, IL.

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## Policy History

<b>Pre-Merger Organizations</b>	<b>Last Review Date</b>	<b>Policy Number</b>	<b>Title</b>
CIGNA HealthCare	11/15/2007	0240	Malignant Melanoma Surveillance Technologies
Great-West Healthcare			

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Connecticut General Life Insurance Company has acquired the business of Great-West Healthcare from Great-West Life & Annuity Insurance Company (GWLA). Certain products continue to be provided by GWLA (Life, Accident and Disability, and Excess Loss). GWLA is not licensed to do business in New York. In New York, these products are sold by GWLA’s subsidiary, First Great-West Life & Annuity Insurance Company, White Plains, N.Y.