10. SKIN CANCER SCREENING

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In this chapter we will address cutaneous melanoma (CM) and nonmelanoma skin cancers (NMSC) including basal cell (BCC) and squamous cell (SCC) cancers. We will not address vulvar or penile cancer specifically nor will we address other rarer skin cancers. The USPSTF report Guide to Preventive Services, 2nd edition (USPSTF, 1996) and several other recent review articles (Preston and Stern, 1992; Marks, 1996; Marks, 1995; NIH, 1992; Koh, Geller, Miller, Grossbart, and Lew, 1996; Rhodes, 1995) obtained from a MEDLINE search formed the basis of this chapter. In addition, we performed a supplementary brief review of recently published books dealing with melanoma prevention and a 1993 to 1996 MEDLINE search of articles on skin cancer prevention (Meyer, et al., 1996; MacKie, 1996; Berwick, Begg, Fine, Roush, and Barnhill, 1996; Black, et al., 1995).

IMPORTANCE

There are an estimated 800,000 new cases of skin cancer diagnosed each year in the US. More than 95 percent of these cancers are NMSC, accounting for approximately one-third of all cancers diagnosed in the US. Although metastasis is uncommon in NMSC, resulting in 2100 deaths per year, there remains significant morbidity from local tissue destruction, and medical costs probably exceed $500 million annually. The mean age of onset is 60 to 65 (USPSTF, 1996; Preston and Stern, 1992).

Cutaneous melanoma (CM) comprises an estimated 34,100 annual incident cases annually, and 7200 deaths. Nearly half of all these cancer deaths occurred in men over 50. The incidence of CM in whites is higher (9.2 per 100,000) than in Hispanics (1.9 per 100,000) or in African Americans and Asians (0.7 to 1.2 per 100,000). There is concern however that the incidence is increasing. It ranks second among adult onset cancers in years of potential life lost as its median age of diagnosis is 53. It is the seventh most frequent cancer in whites in
Epidemiologic data and experimental evidence support cumulative sun exposure (especially UV B radiation) as the major risk for NMSC (Preston and Stern, 1992). Additional factors include: age; a previous NMSC (about 50 percent of patients with a history of NMSC will develop a new skin cancer within five years); a sun sensitive skin type with freckling, relative inability to tan (Indicator 1); light skin and hair color; immunocompromised state (e.g., renal transplant patients in one study had a 253-fold risk of SCC and a tenfold risk of BCC); chemical carcinogens (arsenic, psoralens and UVA treatment, coal tar products and cigarette smoke); ionizing radiation; chronic ulceration or inflammation; viral (HPV); and certain genodermatoses1 (USPSTF, 1996; Preston and Stern, 1992). SCC precursors include solar keratoses (AKs) which are fairly prevalent in the population; about one in 1000 per year progress to invasive cancer (Sober and Burstein, 1995). There has also been a hypothesized link to high fat diet in association with UV radiation exposure (Black, et al., 1995).

CM risk factors, besides white race, with a relative risk of eight or more include: Familial Atypical Mole and Melanoma syndrome; melanocytic precursors or marker lesions including multiple typical moles,2 atypical moles3 and specific congenital moles; prior CM, or CM in a first degree relative (Rhodes, 1995). Additional lower order risk factors include a history of severe sunburn; ease of burning/inability to tan; light hair or blue eyes; family history of NMSC; and excessive sun exposure. The relationship with solar radiation is less clear than with NMSC, although there is some evidence that infrequent, intense exposure (blistering sunburn) at a young age may be linked to CM (Rhodes, 1995) (Indicators 1 and 3).

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1 Genodermatoses: Certain genetic skin conditions. Those syndromes most commonly associated with a high risk of NMSC include Xeroderma Pigmentosum, Basal-cell nevus syndrome, Albinism, and Epidermodysplasia

2 Quantitative examples of multiple common moles include counts of 50 nevi >= 2 mm diameter, or 5 nevi >=5 mm diameter.

3 Also referred to as dysplastic nevi.
SCREENING

Primary prevention interventions include two strategies:

(1) Public education programs

These focus on midday sun avoidance and use of protective clothing (hats, etc.) and use of sunscreens. There is fair evidence that sun avoidance during the midday is effective in preventing skin cancer, while use of sunscreens is controversial. A RCT showed some sunscreens (UVA and UVB blocking agents) effective in preventing new AKs (Thompson, Jolley, and Marks, 1993) but there is conflicting data regarding prevention of NMSC or CM. The USPSTF gives avoidance of sun exposure and the use of protective clothing for adults at risk of skin cancer a "B" recommendation with a "C" recommendation for sunscreen use — insufficient evidence to counsel for or against, except perhaps for persons with solar keratoses (USPSTF, 1996) (Indicator 2).

(2) Clinician counseling

This targets high risk persons to reduce sun exposure through the previously mentioned means. There is some limited evidence that physician counseling regarding sun avoidance can lead to behavior change (USPSTF, 1996). The ACS, AAD, AMA and NIH Consensus Panel recommend patient education on sun avoidance and use of sunscreens (SPF 15 or higher). The USPSTF recommends counseling patients at risk of skin cancer on sun avoidance as does the AAFP (Indicators 1, 2 and 3). One recently published RCT documented the efficacy of a low fat diet in decreasing new NMSC over a two year period in patients with a previous NMSC; however, no indicators are recommended at this time (Black, et al., 1995).

Secondary prevention or early detection of lesions has been approached by three strategies:

(1) Self-examination

This involves promoting regular skin self-examination and disseminating information regarding what constitutes a suspicious lesion or lesion change through public programs or clinician counseling. Skin self-examination can be used for early detection of skin cancer and for evaluating risk status (number of moles, unusual moles). The American Cancer Society has promulgated the "ABCDs" of pigmented lesions as warning signs to seek medical care ("A" is for asymmetry, "B" is border
irregularity, "C" is color variegation and "D" is for large diameter [over 6 mm]). A recent population-based case control study (Thompson, Jolley, and Marks, 1993) found that skin self-examination was associated with a reduced risk of melanoma incidence (OR 0.66, 95% CI 0.44-0.99) and that it may reduce the risk of advanced disease among melanoma patients. The authors recommended a longer follow-up study to verify this claim. The American Cancer Society recommends monthly skin self-examination for all adults, with physician skin exams every three years for persons age 20 to 39 and yearly in persons over age 40. The USPSTF gives a "C" recommendation (insufficient evidence) to counseling patients to perform periodic skin self-examination, except for those with established risk factors for skin cancer (Indicators 4 and 5).

(2) Clinician screening

The goal of physical examination of the skin by a clinician is detection of any suspicious lesion, which should then be confirmed by biopsy. No indicators relating to biopsy are recommended, however, since documentation of lesion characteristics is likely to be inadequate. Among patients presenting for a free skin screening by dermatologists, the sensitivity of the visual exam was 89 to 97 percent with a predictive positive value of 35 to 75 percent for skin cancer (Koh, Geller, Miller, Grossbart, and Lew, 1996). A more recent evaluation of the American Academy of Dermatology (AAD) skin cancer screening programs found the positive predictive value was only seven percent (Koh, et al., 1996). Compared to dermatologists, non-dermatologists are less likely to be able to correctly identify skin lesions from color photographs (USPSTF, 1996). Furthermore, interobserver reliability in identifying atypical moles is poor, although evaluating the numbers and size of moles is more reliable (Meyer, et al., 1996). Although NMSC are common, there is no strong evidence that lesions found by screening result in better outcomes. Theoretically, lesions discovered early should be easier to treat with less disfigurement (USPSTF, 1996). Screening for CM by primary care providers has also not been shown to lead to reduced morbidity and mortality in this country. A time series study in Scotland showed an upward trend in thin tumor presentation and a trend toward decrease in the mortality rate (for women, but not for men) 15 years after a public
and professional education program targeting primary care physicians (MacKie, 1996).

There are no published data evaluating the optimum frequency of screening or surveillance. The USPSTF gives routine screening by primary care providers using a total skin exam a “C” recommendation, indicating there is insufficient evidence to recommend for or against it. Opportunistic screening or case finding, which involves sporadic clinician skin examination of patients who present for another medical problem, is encouraged. However, we are not recommending quality indicators for this.

(3) Surveillance

Surveillance involves regular examination of individuals with previously demonstrated high risk of melanoma or NMSC. Several studies (time series and cohort) have shown that high risk populations under surveillance of dermatologists, often using photography, have tumors discovered at a thinner level than tumors found in the general population or in the index cases (MacKie et al., 1993; Koh, Geller et al., 1996). For CM, there is fairly good evidence that detection and excision at an early stage has a better prognosis. If at time of excision the tumor thickness is less than 0.76 mm, the ten year survival rate is more than 95 percent. If the tumor thickness is greater than 4 mm there is less than a 50 percent ten year survival rate (Rhodes, 1995). The USPSTF recommends that providers consider referring specific high risk persons to skin cancer specialists for surveillance (Indicator 6). In addition, the NIH consensus panel also recommends that all melanoma patients be enrolled in surveillance and a careful family history be taken. High risk family members should also be enrolled in surveillance (Indicators 7, 8, and 9).

In summary, expert opinion and observational data support efforts to reduce skin cancer incidence, morbidity, and mortality by putting emphasis on both public education and an individual approach directed at high risk persons such as the elderly. Clinician strategies include recommending sun protection, promoting skin cancer awareness, and using opportunistic case finding to detect skin cancer and identify very high risk persons for surveillance.
REFERENCES


RECOMMENDED QUALITY INDICATORS FOR SKIN CANCER SCREENING

The following indicators apply to men and women age 18 and older.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Quality of Evidence</th>
<th>Literature</th>
<th>Benefits</th>
<th>Comments</th>
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<tr>
<td><strong>Primary Prevention</strong></td>
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<tr>
<td>1. When a patient is noted to have a sunburn, the chart should document counseling regarding avoidance of midday sun, use of protective clothing, and/or use of sunscreens.</td>
<td>III II-2 II-3¹</td>
<td>NIH Consensus Panel, 1992</td>
<td>Prevent skin cancer.</td>
<td>People who have a sunburn are not practicing skin protection and most likely are in a higher risk group for skin cancer.</td>
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<td>2. Patients who have evidence of actinic keratosis or solar keratosis (AK)², should be counseled regarding avoidance of midday sun, use of protective clothing, and/or use of sunscreens within 1 year before or after diagnosis.</td>
<td>I, III II-2 II-3¹</td>
<td>Thompson, USPSTF; 1996</td>
<td>Prevent development of new AKs. Prevent skin cancer.</td>
<td>AKs are considered precursors for squamous cell carcinoma.</td>
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<td>3. All patients noted to have strong skin cancer risk factors³ should be instructed in midday sun avoidance, use of protective clothing, and/or use of sunscreens within 1 year before or after note of high risk.</td>
<td>III II-2 II-3¹</td>
<td>USPSTF 1996</td>
<td>Prevent skin cancer.</td>
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<td><strong>Secondary Prevention/Skin Self-exam</strong></td>
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<td>4. All patients noted to have strong skin cancer risk factors³ should be instructed in skin self-examination within 1 year before or after note of high risk.</td>
<td>II-2, III</td>
<td>Berwick, 1996; USPSTF, 1996</td>
<td>Prevent morbidity and mortality by looking for melanoma or melanocytic precursor or marker lesions.</td>
<td>Lesions detected early may have a better prognosis.</td>
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<td>5. All patients with a personal history of melanoma or non-melanoma skin cancer (NMSC) should be counseled to do skin self-examination within 1 year before or after the history is documented.</td>
<td>II, III</td>
<td>NIH Consensus Panel, 1992: Berwick, 1996</td>
<td>Prevent morbidity and mortality by looking for melanoma or melanocytic precursor or marker lesions.</td>
<td>Lesions detected early may have a better prognosis.</td>
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<td>6. Patients diagnosed with NMSC or multiple AKs in the past 5 years should have a skin exam documented in the past 12 months.</td>
<td>III</td>
<td>Preston, 1992; ACS, AAD, AAFP, 1996</td>
<td>Prevent morbidity and mortality from skin cancer.</td>
<td>Lesions detected early may have a better prognosis. About 50% of patients will develop a new skin cancer within 5 years.</td>
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<td>7. Referral to a dermatologist for surveillance/screening should be documented if a patient has either of the following: a. personal history of cutaneous melanoma (CM); b. multiple common or atypical moles plus a family history of CM (possible FAM-M phenotype).</td>
<td>II-2,II-3 III</td>
<td>MacKie, 1994; NIH Consensus Panel, 1992; USPSTF, 1996</td>
<td>Prevent morbidity and mortality by looking for melanoma or melanocytic precursor or marker lesions.</td>
<td>Melanoma lesions, when detected in patients under surveillance, tend to be thinner. Thinner lesions have a better prognosis.</td>
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<td>8. All patients newly diagnosed with melanoma should be advised to have family members undergo a screening skin exam.</td>
<td>III</td>
<td>NIH Consensus Panel, 1996</td>
<td>Prevent morbidity and mortality by looking for melanoma or melanocytic precursor or marker lesions.</td>
<td>Although uncommon, the genetic phenotype associated with melanoma conveys a very high risk.</td>
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<td>9. All patients with a documented family history of melanoma in a first degree relative should have a screening skin exam at least once in the year preceding or subsequent to documentation.</td>
<td>III</td>
<td>NIH Consensus Panel, 1996</td>
<td>Prevent morbidity and mortality by looking for melanoma or melanocytic precursor or marker lesions.</td>
<td>See above.</td>
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 Definitions and Examples

1 II-2 and II-3 for indicators 1-3 relate to evidence linking sun exposure to these cancers, though there is no evidence directly linking protective measures and decreased rates of skin cancer.
2 AKs: actinic keratosis or solar keratosis. These are both a precursor and a marker of increased risk for NMSC. Clinically, they are rough, scaly, erythematous patches on chronically sun exposed skin.
3 Strong skin cancer risk factors: family history of skin cancer, large number of moles, or atypical moles.
4 Cutaneous melanoma.
5 Atypical moles: Also referred to in the literature as dysplastic nevi, these are acquired pigmented lesions of the skin; they vary in size, have macular and/or papular components and have borders that usually are irregular and frequently ill defined. Their color is variegated. Histologically they exhibit architectural disorder, with or without melanocytic atypia. Atypical nevi may occur in 5-10% of the population.
6 FAM-M: Familial atypical mole and melanoma syndrome - a syndrome characterized by the occurrence of melanoma in one or more first degree or second degree relatives, plus having a large number of moles (often > 50) and moles with distinct histologic features; lifetime risk of development of melanoma may approach 100%.

Quality of Evidence Codes

I Randomized Controlled Trial (RCT)
II-1 Nonrandomized controlled trials
II-2 Cohort or case analysis
II-3 Multiple time series
III Opinions or descriptive studies