Skin Cancer
Identification & Management

An ongoing epidemic

Elizabeth Norheim, CNP, MBA
Dermatology Service
Minneapolis VAHCS

Objectives

• At the end of this presentation, you will be able to
  • Be aware of the current research and recommendations for skin cancer prevention, screening, identification and treatment.
  • Understand the essential role of the primary care provider in the care of patients with or at risk for skin cancer.

Skin Cancer Epidemic

• Skin cancer is the fastest growing cancer
  • Prevalence of skin cancer history 5X higher than breast and prostate cancer
  • Greater than the 31-year prevalence of all other cancers combined

• Skin cancer is 95% preventable

Skin lesion photograph credits thank you to:

Dermatology clinic staff & professors, Drs. Erin Warshaw & Noah Goldfarb
Minneapolis VAHCS, University of MN Medical School

Non-melanoma skin cancer

• 2-3.5 million new cases each year (not reportable)
• 2000 deaths
• 40-50% of U.S. residents who live to age 65 will develop at least one non-melanoma skin cancer
• PCPs can expect to diagnose 6-7 cases of BCC and 1-2 SCC per year (2014 data).

Melanoma

• Major environmental risk factor is intermittent sunlight exposure
• Despite improved survival rates, the death rate continues to climb
• Melanoma is more than 20 times more common in whites than in African Americans
• Overall, the lifetime risk of getting melanoma is about 2.6% (1 in 38) for whites, 0.1% (1 in 1,000) for blacks, and 0.58% (1 in 172) for Hispanics

www.cancer.org
Cancer Facts and Figures, 2014

www.skincancer.org


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Melanoma

- According to WHO statistics worldwide, melanoma rate increasing faster than any other cancer
  - ↑ young women 50% from 1973-2004
- Lifetime risk (in situ and invasive melanoma): 1/30
- The American Cancer Society’s estimates for melanoma in the United States for 2018 are:
  - About 93,270 new melanomas will be diagnosed (about 55,150 in men and 38,120 in women)
  - About 9,320 people are expected to die of melanoma (about 5,990 men and 3,330 women).
- The rates of melanoma have been rising for the last 40 years

Young women and melanoma

- Data from the National Cancer Institute’s Surveillance, Epidemiology and End Results Program (SEER)
  - Melanoma incidence in white men and women age 15 to 39 from 1973-2014
- 50% ↑ incidence in young women
  - 1973: 5.5/100,000
  - 1980: 9.4/100,000
  - 2004: 13.9/100,000
  - 2014: 20.2/100,000
- Melanoma is 1% all skin cancers

Primary Care Providers & Skin Cancer

- Over 79% of persons in the U.S. visit their primary care doctor at least once a year.
- In a study of melanoma patients
  - 87% had a regular physician
  - 63% had seen those physicians in the year prior to diagnosis
  - Only 24% had regular dermatologists
- Skin cancer control practices are performed less frequently than other preventative practices
  - 60% routinely performed full-body exams on high risk patients (Gellar)

Why?

- Numerous reasons
  - Lack of time
  - Lack of provider confidence and inadequate training
    - In one review of four IM residencies, 76% residents never trained

Basal Cell Carcinoma

- 90% of ALL CANCERS in the U.S. are basal cell carcinoma
- 70-80% of all skin cancers in men and 80-90% in women
- Within 5 years of diagnosis of one BCC 35-50% will develop a new skin cancer

www.acs.org

www.cancer.org
Basal Cell Carcinoma Subtypes

- All BCC are not created equal
- Different histologic subtypes, different locations often behave differently
- Treatment recommendations vary
- If your pathologist doesn’t report subtype ask them to do so

Basal Cell Carcinoma

- Nodular
- Superficial
- Reticulated
- Micronodular
- Infiltrative
- Sclerosing (Morpheiform)
- Mixed
- Metatypical/Basosquamous

Nodular Basal Cell Carcinoma

Superficial Basal Cell Carcinoma

Sclerosing Basal Cell Carcinoma
Basal Cell Carcinomas

- BCCs are abnormal, uncontrolled growths or lesions that arise in the skin’s basal cells, which line the deepest layer of the epidermis (the outermost layer of the skin).
- BCCs often look like open sores, red patches, pink growths, shiny bumps, or scars and are usually caused by a combination of cumulative and intense, occasional sun exposure.
- BCC almost never spreads (metastasizes) beyond the original tumor site.

Vismodegib

- First-in-class hedgehog signaling pathway inhibitor approved for the treatment of adult patients with BCC.
- It acts as a competitive antagonist of the SMO (“smoothens hedgehog”) receptor in the hedgehog signaling pathway.
- Vismodegib is indicated for patients with metastatic or relapsed BCC.
- Common adverse effects include GI disorders (nausea, vomiting, diarrhea, constipation), muscle spasms, fatigue, hair loss, and dysgeusia (distortion of the sense of taste). These adverse effects are mostly mild to moderate.
- Vismodegib can cause embryo-fetal death and severe birth defects and must not be used during pregnancy.
- Dose=150mg QD

Squamous Cell Carcinoma

- 10-30% of all skin cancers.
- SCCs often look like scaly red patches, open sores, elevated growths with a central depression, or warts; they may crust or bleed.
- Greater risk of metastasis.
- More than 1 million cases of squamous cell carcinoma are diagnosed each year in the U.S., and (depending on different estimates) as many as 8,800 people die from the disease. Incidence of the disease has increased up to 200 percent in the past three decades in the U.S.
- Commonly seen on sun-exposed areas such as face, ear, neck, lip, dorsal hand.
- Actinic keratoses considered precursors.

Squamous Cell Carcinomas in a renal transplant recipient on the upper thigh and buttocks. There are multiple firm nodules, partially ulcerated. The patient had multiple, similar lesions elsewhere on the body. Since he had psoriasis and had spent considerable time in the sun, the lesions in the sun-exposed sites were probably caused by UV. The lesions shown here are probably related to HPV as he had a similar lesion perianally and on the glans. The ulcer on the right is a site of an excision from which sutures were prematurely removed.

Squamous Cell Carcinoma

- Squamous cell carcinoma (SCC) is an uncontrolled growth of abnormal cells arising in the squamous cells, which compose most of the skin’s upper layers (the epidermis).
- SCC is mainly caused by cumulative ultraviolet (UV) exposure over the course of a lifetime; daily year-round exposure to the sun’s UV light, intense exposure in the summer months, and the UV produced by tanning beds all add to the damage that can lead to SCC.
- SCCs may occur on all areas of the body including the mucous membranes and genitals, but are most common in areas frequently exposed to the sun.
Images have been removed from the PowerPoint slides in this handout due to copyright restrictions.

The Spectrum of Squamous Cell Carcinoma

- Actinic Keratoses
  Individual AK has approximately 8-10% risk of progression
  - Squamous Cell Carcinoma in situ (Bowen's Disease)
  - Invasive Squamous Cell Carcinoma
  - Metastatic Squamous Cell Carcinoma

SCC in situ (Bowen's type)

SCC, Keratoacanthoma type

Squamous Cell Carcinoma

- Lip or ear location
- Tumor diameter > 2cm
- Depth > 4mm (Clark's levels IV and V)
- Poor histologic differentiation
- Perineural involvement
- Aggressive histology
- Arising in scar or chronic ulcer
- Arising in osteomyelitis
- In immunocompromised patients (transplant)
- Recurrent
- Neglected lesions
- CLL patients

High Risk Squamous Cell Carcinoma
So you have a suspicious lesions. . .

- **Biopsy**
  - Punch
  - Shave
    - Not best if depth important
  - Excisional biopsy
- Tell your patient you are doing a BIOPSY!
  - Will require a second procedure
- Determine subtype
- Treat or refer
  - Or call to ask

### Treatment

- **Excision**
- **ED&C (electrodesiccation and curettage)**
- **Radiation**
- **Mohs Surgery**
- **Cryosurgery**
- **Intralesional Injection (Interferon, 5-Fluorouracil)**
- **Chemotherapy**
  - **Imiquimod**

### Surgical Excision

**Advantages**

- Relatively easy
- Relatively inexpensive
- Favorable scarring
- Usually done in the office with local anesthesia

**Disadvantages**

- Margins not always easy to identify clinically or histologically
- Relatively high recurrence rate (10%)**

### Electrodesiccation & Curettage

**Advantages**

- Efficient and cost effective (often done at time of biopsy)
- Anesthetize locally, biopsy, electrodesiccation and curettage the site x 3

**Disadvantages**

- No histologic confirmation of negative tumor margins
- Often greater scarring
- Not great on face
- Not indicated for high risk or recurrent tumors

### Radiation Therapy

**Advantages**

- Useful in patients who are unwilling or unable to tolerate surgery
- May preserve function in difficult areas (eyes, nose, ears)

**Disadvantages**

- Requires multiple visits over weeks
- Expensive
- Risk of developing additional malignancy in radiated area 10-30 years after treatment restricts this modality to the elderly in most cases
Mohs Surgery

- Allows for the precise evaluation of 100% of the surgical margins of excised tumor (standard excision allows for examination of <1% of surgical margin)
- Ability to precisely map tumor extensions allows for maximum conservation of noninvolved skin

Mohs Surgery for BCC and SCC

- High risk features
- High risk patients
- High risk locations
- Recurrent tumors
- Incompletely excised tumors (especially face)
- Cosmetically important areas
- Young patients
- Indistinct clinical margins
- Rapid or aggressive growth behavior

“Danger Areas”
Locations at High Risk for Recurrence or Metastasis

- Peri orbital
- Nose/paranasal
- Periauricular and tragal
- Mucous membranes
- Lips
- Nail bed and matrix
- Genitalia
- Temple and scalp

Mohs Surgery

Advantages

- Best cure rate
- Done in office with local anesthesia
- Allows for maximal tissue sparing

Disadvantages

- Time consuming
- Requires special training, equipment, personnel, and expertise
- Access to care

Imiquimod 5% cream
(Aldara®, 3M)

- Immune response modifier
  - Induces interferons, TNF and interleukin-12
  - Cell-mediated immune response

- FDA approved to treat genital warts, actinic keratoses, superficial BCC
  - BCC: 73-82% clearance
  - AK: 86.6% reduction
  - Long-term results unknown

How to use

- Actinic Keratoses
  - Apply thin film 2-3 times weekly (8 hours/overnight) until clear or up to 16 weeks
- Superficial Basal Cell Carcinoma
  - Apply thin film 5 times weekly (8 hours/overnight) until gone or up to 6 weeks
Adverse effects

- Common: Irritation, inflammation, blisters, pruritus, rash
- Not uncommon: flu-like symptoms (chills, aches, sore throat, malaise, fatigue)
- Expensive: $400.00 per 24 packet box (drugstore.com; $390.00 in 2018)
  - 1 packet per facial application
  - $400.00-500.00 for actinic keratoses treatment course (depends on distribution/extent)
  - Approximately $500 per BCC (variable)

Biggest problems

- Inappropriately used
  - Patients don’t complete the course because of expense, irritation, or they don’t think it’s doing anything
  - Poor physician communication
- Follow-up ignored
  - If not completely resolved, repeat biopsy
  - Surgical treatment
  - MUST follow this into the future
  - Aggressive recurrence?

Recommendations

- Small, low risk BCC
  - ED&C (>1cm has a greater recurrence risk)
  - Excision: 3-5mm margins (some studies say 5-10mm)
  - 5% Imiquimod: <3cm, superficial histopathology
    - MUST understand duration, follow-up
  - Recurrent or high risk BCC (or significant cosmetic implications)
    - Mohs/refer
- Small, low risk SCC
  - Excision: 5-10mm margins
  - Recurrent or high risk SCC (or cosmetic implications)
    - Mohs/refer
- Skin malignancy in immunocompromised/transplant/CLL patient (especially SCC)
  - Refer

Adjuvant therapy

(Treat the Actinic Keratoses!)

Follow-up

After the cancer

Cryosurgery for Actinic Keratoses

- Up to 98% cure rate
- Cure rates depend on treatment adequacy
  - 39% with freeze duration <5 seconds
  - 69% with freeze duration >5 seconds
  - 83% with freeze duration > 20 seconds
- Hypertrophic, thicker lesions require more aggressive treatment

Adjuvant therapy

- Cryosurgery
- Topical Fluorouracil (Efudex®, Carac®, Fluoroplex®)
- Imiquimod (5% Alldrea® 3.75% Zyclara®)
- Dichloroacetic (Silvadene®)
- Adapalene (Differin®)
- Tretinoin (Retin-A®)
- Tazarotene (Tazorac®)
- Dermabrasion
- Laser resurfacing
- Chemical Peels
- Photodynamic therapy (Kerastick® and Blu-U®)
- Acitretin (Soriatane®)
- Others
Actinic Keratosis

To use topical fluorouracil correctly...

- Patient applies a thin layer of cream to affected areas, not individual lesions
  - Once daily to face and neck
  - Twice daily to hands, arms, scalp
- Approximately 4 weeks
- Severe inflammation is an expected and many believe necessary outcome of therapy

Topical fluorouracil

- Cream 0.5%, 1% and 5%. Solution 2%.
- Efudex®, Carac®, Fluoroplex®
- FDA Approved: multiple actinic keratoses and superficial BCC (when conventional methods impractical)
- Warning: Dihydropyridine Dehydrogenase (DPD) deficiency
- Relatively inexpensive, effective and simple to use
  - $388.40/40 gm tube (drugstore.com 04-30-2018)
- Patient tolerability often difficult
  - Improvement requires a significant inflammatory response
- Pregnancy category X

Calcipotriene topical

- Cream/foam: Apply a thin layer to affected areas twice a day and rub in gently and completely
- Ointment: Apply a thin layer to affected areas once or twice a day and rub in gently and completely
- May cause transient burning, stinging and tingling, which occurred in approximately 23% of patients. Rash was reported in about 11% of patients. Dry skin, irritation and worsening of psoriasis were reported in 1-5% of patients.
- Safety & effectiveness not shown in children. Because of a higher ratio of skin surface area to body mass, pediatric patients are at greater risk than adults of systemic adverse effects when they are treated with topical medication.
- Calcipotriene may enhance the effect of UVB to induce skin tumors. Patients that apply Calcipotriene Topical to exposed portions of the body should avoid excessive exposure to either natural or artificial sunlight (including tanning booths, sun lamps, etc.).
- Pregnancy category C
Efudex® Dermatitis

**Photodynamic Therapy**

- Photosensitizer applied to diseased skin
- Converted by neoplastic tissue into photoactive porphyrins IX
- Light source targets the porphyrins
  - Blu light (Blu-U®) penetrates superficially, Red light (e.g. pulsed dye laser penetrates more deeply)
- Protoporphyrin IX absorbs light, elaborating singlet oxygen
- Targets diseased tissue
  - Destroys plasma and mitochondrial membranes of rapidly dividing cells

**Follow-up of Nonmelanoma Skin Cancer Patients**

- No standard recommendations
  - 6 months and at least annually thereafter
- Regional lymph node palpation in SCC patients
- Waist-up exam
  - Legs
  - Consider complete exam

**Special Consideration Transplant Patients**

- Markedly increased risk of atypical and highly invasive NMSC
- Some studies show up to 50% risk of NMSC
- The older the transplant, the greater the sun exposure, the higher the risk
- Regular dermatologic follow-up **essential**
Melanoma Risk Factors

- >50-100 moles
- Dysplastic nevi (atypical moles)
- Fair complexion
- Freckling tendency
- History of severe blistering sunburn
  - 3 or more during childhood
  - Outdoor occupation
  - Teen years
- History of nonmelanoma skin cancers
- Family history of melanoma
- Family history of dysplastic nevi

Fitzpatrick Skin Types

<table>
<thead>
<tr>
<th>Skin Type</th>
<th>Details</th>
<th>Skin reactions to solar radiation</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Always burns easily and severely (painful burn); tans little or not at all</td>
<td>People most often with fair skin, blue eyes, freckles; unexposed skin is white</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Usually burns easily and severely (painful burn); tans minimally or tans evenly</td>
<td>People most often with fair skin, red or blond hair, blue, hazel or even brown eyes, unexposed skin is white, normal average Caucasian, unexposed skin is white</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Burns moderately and tans about average with each exposure; exhibits minimal pigmentation (no freckles)</td>
<td>People with white or light brown skin, dark brown hair, dark eyes (e.g., Mediterraneans, Mongoloids, Orientals, Hispanics, etc); unexposed skin is white or light brown</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Burns minimally, tans easily and above average with each exposure; exhibits immediate pigmentation (darkening) reaction</td>
<td>People with white or light brown skin, dark brown hair, dark eyes (e.g., Mediterraneans, Mongoloids, Orientals, Hispanics, etc); unexposed skin is white or light brown</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Rarely burns, tans evenly and substantially; always exhibits minimal reaction</td>
<td>People with black skin (e.g., African and American Negroes, Australian and South Indian Aborigines); unexposed skin is black</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>Never burns and tans profusely; exhibits no reaction</td>
<td>People with extremely dark skin (e.g., dark Africans, dark Inuit, South American Indians); unexposed skin is black</td>
<td></td>
</tr>
</tbody>
</table>
What is a “dysplastic nevus”?  
- “Benign” nevus that is difficult to distinguish clinically and histologically from melanoma  
- (atypical mole, nevus with architectural disorder)

Dysplastic “Atypical” Nevi
- Often asymmetrical  
- Often larger than average  
- Variegate color  
- Irregular “fuzzy” borders  
- “Fried-egg appearance”  
- Atypical histologic features

A B C D E’s of melanoma
- Asymmetry  
- Border  
- Color  
- Diameter/Different  
- Evolution/Elevation

Malignant Melanoma
- Highest incident in Australia and New Zealand.
- Risk factors: fair complexion, excessive childhood sun exposure and blistering childhood sunburns, an increased number of common and dysplastic moles, a family history of melanoma, the presence of a changing mole or evolving lesion on the skin, and older age.
What is a dysplastic nevus?

- A “benign” nevus that is difficult to distinguish clinically and histologically from melanoma
  - “Dysplastic nevi” are very common
  - Not all dysplastic nevi are the same
  - The presence of multiple dysplastic nevi, especially in the context of a family history of melanoma means the patient may have an increased risk of melanoma
  - Excising every clinically or histologically “dysplastic nevus” will not alter that risk

Acral lentiginous and subungual melanoma

- Least common subtype of melanoma (2-8% of melanoma cases in white persons). Accounts for 29-72% of melanoma cases in dark-skinned individuals.
- Delays in diagnosis, may be associated with a worse prognosis.
- Occurs on the palms, on the soles, or beneath the nail plate (subungual variant).
- Subungual melanoma may manifest as diffuse nail discoloration or a longitudinal pigmented band within the nail plate. It must be differentiated from a benign junctional melanocytic nevus of the nail bed, which has a similar appearance. Pigment spread to the proximal or lateral nail folds is termed the Hutchinson sign, which is a hallmark for acral lentiginous melanoma.

Dermoscopy

- Non-invasive technique using hand-held magnification to improve diagnostic accuracy
- Uses pattern analysis, specific algorithms and experience to aid in the diagnosis of melanoma
- Algorithms
  - 3 point method
  - ABCD rule
  - Modified ABCD
  - Pattern recognition
  - 3 point method
Other uses

- Non-pigmented malignancies
- Vascular lesions/structures
- Inflammatory skin disease
- Infestations
- Others...

Dermoscopy

"Dermoscopy is a valid, simple and safe method for PCPs to identify high-risk lesions that require further examination by experts."

- PCPs: increased sensitivity
  - Referral
  - Biopsy
- **Do not use dermoscopy to “rule out” a biopsy**
- **DO NOT use dermoscopy without training**

Malignant Melanoma

On the back of a 23 year old female with dysplastic nevus syndrome

- Asymmetry of color and structure?
- Net of thick lines with irregular distribution?
- Blue and/or white structures?
  - Diagnosis: **Nevus**

Leg lesion in 45 year old woman with dysplastic nevus syndrome

- Asymmetry of color and structure?
- Net of thick lines with irregular distribution?
- Blue and/or white structures?
  - Diagnosis: **Melanoma**

65 year old male
New mole on back
53 year old woman with recent change of arm nodule

- Asymmetry of color and structure?
- Net of thick lines with irregular distribution?
- Blue and/or white structures?
- Diagnosis: Melanoma

Johr et al 2006

So you think you see a melanoma
What’s next?

- Do a biopsy
  - ALWAYS tell the patient that more than one procedure is necessary
  - What kind?

What do you want from your biopsy?

- Fundamental features for histopathologic evaluation of melanocytic lesions
  - Symmetry, circumscription, maturation of melanocytes with progressive descent into dermis
  - Depth
- Partial biopsies associated with misdiagnosis and underdiagnoses
- Complete excision is optimal
  - Narrow margins, simple closure will not compromise sentinel node biopsy

So you think you see a melanoma. What is next?

- Do a biopsy
  - ALWAYS tell the patient that more than one procedure is necessary
  - What kind?
    - Excisional biopsy
      - Optimum, not always possible
      - Saucerization
        - Allows for histologic evaluation of the entire architecture but DO NOT TRANSECT THE LESION
    - Punch
      - Gets the depth [in that area, anyway] but does not allow for architectural evaluation and may miss the true depth

Melanoma is 3-dimensional and asymmetric
Melanoma is 3-dimensional and asymmetric

So you think you see a melanoma.

. . . What's next?

- Do a biopsy
  - ALWAYS tell the patient that more than one procedure is necessary
- What kind?
  - Excisional biopsy
    - Optimum, not always practical
    - Saucerization
      - Allows for histologic evaluation of the entire architecture but **DO NOT TRANSECT THE LESION**
  - Punch
    - Gets the depth (in that area, anyway) but does not allow for architectural evaluation and may miss the true depth
  - Shave
    - **Never!**

Really big Oops!

Breslow level

"Thickness"

Measures the total vertical height of the melanoma from the granular layer of the epidermis to the area of deepest penetration

Do the right biopsy!

Therapeutic recommendations depend on

Tumor thickness
Clark Level

- I - all melanoma cells restricted to the epidermis
- II - melanoma cells penetrating into the papillary dermis
- III - melanoma cells filling the papillary dermis
- IV - melanoma cells extending into the reticular dermis
- V - invasion of the subcutaneous tissue

Clark Level 4 ≠ AJCC Stage IV

AJCC = American Joint Committee on Cancer

- “Stages” melanoma on the basis of depth, presence of absence of ulceration, nodal involvement and metastasis
  - Stage IV 5-year survival: 9-19%
  - Breslow < 1 mm with ulceration or Clark level IV/V (T1bN0M0) (Stage lb): 5-year survival 91%

Other Histologic Criteria

- Ulceration
- Histologic subtype
- Regression
- Mitotic rate
- Inflammatory response
- Neurotropism
- Precursor lesion

Important histologic findings

- Breslow level
  - Most important histological determination of prognosis
- Ulceration
  - Second only to thickness in terms of prognostic value in some studies
  - Width of surface ulceration inversely correlated with survival
  - Iatrogenic ulceration does NOT count!
- Mitoses
  - ANY mitoses important
  - Mitosis >1/mm² an important predictor of LN status

So now, you have the diagnosis

Get help

- Melanoma treatment and follow-up recommendations are fluid and controversial
- Team approach
  - Dermatologist, Surgeon, Oncologist, Primary physician, others

Please do not re-excite

Treatment

- Surgical Excision
  - Margins depend on Breslow thickness, other variables
- Lymph node evaluation
- Adjuvant Therapy
Lymph Node Evaluation & Melanoma

- The presence or absence of melanoma in LN is the strongest predictor of overall survival and risk of recurrence
- WHO Elective LN Dissection Trial
  - ELND did not impact survival
    - Early dissection had no impact on natural history of primary melanoma
    - Incidence of node positive patients very low
  - Nodal status influences survival

Sentinel Lymph Node Biopsy

- Evolved as a way to establish lymph node status without the morbidity of wide lymph node dissection
- Refer to General Surgery

Where to look?

mskcc.org

SLNB Key Points

- SLNB less invasive and more sensitive than ELND for detection of nodal micro-metastasis
  - Allows for intensive histopathologic evaluation of a limited number of LN
- SLN status is currently the most sensitive and specific staging tool available
- Limited data on cost effectiveness
  - $7000-$15,000
  - Cost effective for melanoma >1mm

Adjuvant Therapies

- Interferon-alpha
  - Only FDA approved adjuvant
- Isolated limb perfusion
- Immunotherapy
  - Melanoma vaccine
- Chemotherapy
- Gene therapy

Melanoma Follow-up: Goals

- Early detection of recurrence
  - Surgical resection if possible
- Detection of other primary melanomas
  - 4-8% rate of second primary
- Patient education, emotional support, and reassurance
  - Most studies report 50% or more of recurrences are found by patients themselves
  - Prevention strategies
- Quality assurance: collection of data to improve future treatment and surveillance strategies
Melanoma Controversies

- Incidence
  - Real or increased surveillance and diagnosis?
- Role of Sentinel Lymph Node Biopsy
- Labs, CXR, Imaging Studies
  - What to do and when to do them?
- Sunlight and Melanoma
- Sunscreens and Melanoma
- Vitamin D, UV light, Melanoma
- Artificial UV light and Melanoma

Indoor tanning

- 35% American adults, 59% college students, 17% teens have used a tanning bed in their lifetime
- 7.8 million adult women and 1.9 million adult men in US tan indoors
- Research indicates that more than half of indoor tanners (52.5%) start tanning before age 21 years
- Multibillion dollar industry ($2.6 billion 2010)
- 70% tanning salon patrons are Caucasian girls & young women, and melanoma is the second most common cancer in females age 15-29.
- Tanning booth users have 1.5x ↑ risk BCC, 2.5x ↑ risk SCC and 7x ↑ risk melanoma
- Industry refutes evidence

Myth, Misperception and Truth

- Indoor tanning protects against sunburn
- Indoor tanning produces Vitamin D which reduces malignancy risk

- No tan is safe
- Tanning occurs as a response to DNA damage
- Acute tan offers SPF 2-3
- Vitamin D conversion occurs in UVB spectrum
- Vitamin D role/ optimum levels still being studied
- Unless GI absorption precludes, oral supplementation safer option

WHO and Tanning

- Elevated tanning beds to its highest cancer risk category – “carcinogenic to humans” (Group 1)
- Tanning bed use raises the risk of melanoma of the skin by 75% when use starts before the age of 30
- Due to cumulative dose
- Link between tanning bed use and risk of melanoma of the eye extends the cancer-causing effects to UVA light
- Indoor tanning should be restricted in anyone under the age of 18
- The American Cancer Society recommends people avoid tanning beds altogether

Tanning Addiction

- Repeated tanning leads to behavior similar to that in other substance dependence
  - 39.3% met DSM-IV-TR criteria for substance-related disorder
  - 30.6% met CAGE criteria for addiction
- UV radiation associated ↑ p53 expression may lead to increased β-endorphins

FDA Black Box Warning: Causes Skin Cancer

https://www.sciencemag.org/article/indoor-tanning-should-be-illegal-for-teens

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Prevention—
The Rationale for Protecting Children

- Excessive sun exposure early in life is the best predictor of later development of skin cancer
- 80% of lifetime sun exposure is acquired by the age of 18
- One or more severe sunburns before 20 years of age more than doubles the risk of skin cancer

Environmental Factors Contributing to Skin Cancers: Ultraviolet Radiation

- 95-98% UVA (320-400 nm)
  - Penetrates more deeply
  - Goes through window glass
  - Tanning booths
- Not as good at preventing sunburn than UVB tanning
- 5% UVB (290-320 nm)
  - 3x more erythemogenic than UVA
  - UVC completely absorbed by stratospheric ozone

Sun protection guidelines

- Limit Time in Sun
  - Avoid unnecessary sun exposure, especially during the sun’s peak hours (10am to 4pm).

- Seek the Shade
  - Always seek the shade and avoid reflective surfaces.

- Cover Up
  - Wear long-sleeved shirts and long pants, tightly woven fabrics and dark colors, such as deep blue and black or bright colors such as orange and red (they offer the best protection). If you can see light through fabrics, then that material is not protecting against harmful UV rays. Wetter also reduces fabrics ability to protect against UV rays.
  - Wear a broad-brimmed hat that extends around the hot spot. If opting for a baseball cap or visor, be sure to use sunscreen as the lower face, neck and ears are left exposed.
  - Wear UV-blocking sunglasses that wrap around or have large frames.

Sunscreen guidelines

- Choose sunscreens that protect against UVB and UVA
  - UVA protection: Titanium Dioxide, Zinc Oxide
  - SPF 30 to 50 (SPF applies only to UVB sunscreens)

HOW HIGH OF AN SPF?

- SPF 15: 93% of UVB blockage
- SPF 30: 97% of UVB blockage
- Higher #: UVA coverage also

Skin Cancer Patients May be at Risk for other Cancers

Nonmelanoma skin cancers and overall cancer risk

- Patients with history of skin cancer had 2x risk of developing another type of cancer
- Even after adjusting for other risk factors, including age, sex, body mass index, education, skin type, sunburn history, and smoking history
- Most common were most frequently diagnosed cancers in US: lung, colorectal, breast, and prostate cancer
- Highest risk for melanoma
- Strongest association in those with NMSC diagnosed at younger age (25-44)
**Melanoma and other primary malignancies**

- Cutaneous melanoma patients had a 32% higher risk of developing any second primary malignancy
- Significantly ↑ risk for 13 cancers
  - Skin melanoma, soft tissue, eye and orbit melanoma, nonepithelial skin, salivary gland, bone and joint, thyroid, kidney, CLL, brain and nervous system, non-Hodgkin lymphoma, prostate, female breast

**Families who should be referred for genetic evaluation**

- Individuals with 3 or more primary invasive melanomas
- Families with at least one invasive melanoma and two more cases of melanoma and/or pancreatic cancer among first- or second-degree relatives on the same side of the family

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**Who should be screened for skin cancer?**

http://www.pamf.org/images/womanskin.jpg

**US Preventative Services Task Force Guidelines 2009/10**

- USPSTF found that PCPs are moderately accurate in diagnosing melanoma from images
- Accuracy studies with real-life whole-body skin exams by doctors or patients are still lacking
- No direct evidence that skin cancer screening improves outcomes
- Applies to general adult population with average skin cancer risk
- Providers and patients should consider individual patient’s risk and preferences when deciding whether to make complete skin exam a regular part of preventive care

**However . . .**

- Providers find melanoma at an earlier stage
  - More curable
- Many melanomas in dermatologists’ offices are found on incidental skin exams when the patient presents for something else

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Skin Cancers

Are common
Are preventable
Are curable

Look and you shall find
Primary Care providers are on the frontline
Skin cancer patients are at risk for more cancer (skin and other)

References

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