Skin Cancer and Sun Protection: Everything you wanted to know and didn’t know who to ask

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Skin Cancer

- Non-melanoma skin cancer constitutes 1/3 of all cancers in the US
- Children born in 2000:
  - 1 in 7 lifetime risk of BCC
  - 1 in 4 lifetime risk of AK
  - 1 in 40 lifetime risk of SCC
Skin Cancer

• Detection of:
  – Actinic keratosis
  – Squamous cell carcinoma
  – Basal cell carcinoma
  – Melanoma

• Prevention
Actinic Keratosis – “Pre-cancers”

- Chronically sun-exposed skin
- Slightly scaly or hyperkeratotic patches or plaques
- Pink, red, pigmented, or flesh colored
- Sand paper feel (easier felt than seen)
- <5% develop into squamous cell carcinoma
- Caused by excessive sun exposure
Basal Cell Carcinoma

• “The pimple that won’t heal”
• Most common skin malignancy in humans
• Derived from basal keratinocytes
• Caused by excessive sun exposure $\Rightarrow$ ionizing radiation $\Rightarrow$ genetic determinants
Basal Cell Carcinoma

- 99% of pts are Caucasian
- 95% between 40 and 79 y/o
- 30% - 40% of pts with BCC will develop additional BCC’s within 10 years
- Rare metastasis (dependent on connective-tissue stroma) – 0.0028% - 0.55%
Basal Cell Carcinoma

- Waxy, pearly, pink papule with rolled border
- Telangiectasias
- +/- ulceration, crusting
- Frequent bleeding
- Slow growing
Squamous Cell Carcinoma

- Derived from keratinocytes
- Caused by excessive sun exposure > chronic wounds, burn scars, HPV, chemical carcinogens
Squamous Cell Carcinoma

- Face: BCC >> SCC
- Hand: SCC >> BCC
- More likely to metastasize than BCC (0.5% - 5.2% from all skin sites)
- Higher metastasis rate from lip (13.7%), ear (8.8%), temple, and hand
- Higher metastasis rate from SCC arising in scars (37.9%)
Clinical Presentation of SCC

- Slowly or rapidly growing
- May arise in an actinic keratosis
- Firm, red papule or plaque
- Ulcerated/crusted
- Scaly, non-healing patch
Melanoma

- 1 in 80 Americans will develop melanoma
- Incidence has increased 1000% in last 50 yrs
- Arise from melanocytes
- Usually has a prolonged radial growth phase (lesion expands asymmetrically) **CURABLE**, followed by development of nodule (vertical growth phase) **DEADLY**
Prognostic Indicators

• Depth of invasion
  – Breslow depth
  – Clark’s level

• Presence of ulceration
Warning Signs of Melanoma

- New mole after age 35
- Changing mole (color, size)
- Symptomatic mole (itching, bleeding, painful)
- 50% of MM develop in existing moles, 50% de novo
ABCD’s of Melanoma

• A – Asymmetry
• B – Border irregularity
• C – Color irregularity
• D – Diameter > 6mm
Melanoma Risk Factors

- Light complexion/eyes/hair
- h/o blistering sunburns
- Tendency to tan poorly and sunburn easily
- FH melanoma
- h/o atypical nevi
- > 50 nevi
Types of Melanoma

- Superficial Spreading (70%)
- Nodular (15%)
- Acral-lentiginous (10%)
- Lentigo Maligna/Lentigo Maligna Melanoma (5%)
- Amelanotic
Early detection can save your life

• Find them early
  – Monthly self exam
    • Know your skin
  – Yearly skin check by a physician
    • Primary care physician or dermatologist
Prevention is the Key!

- Acute overexposure to sunlight -> painful, red, sunburned skin
  - Linked to skin cancer later in life
- Long-term overexposure -> wrinkles, freckles, age spots, dilated blood vessels, changes in the texture of the skin
  - Make skin look older
  - Skin cancers
4 YEARS
Early sun damage is evident on this 4-year-old.

17 YEARS
This teenager already has significant sun damage because of deliberate tanning on the beach and in tanning salons.

37 YEARS
Sun damage is accumulating under the surface of the skin.

64 YEARS
Years of sun damage have taken a toll on the skin of this beach community resident.
Sun Protection

• Sun produces both visible (“light”) and invisible rays
  – Even on a cloudy day, 80 % of the sun’s ultraviolet rays pass through the clouds
• Invisible rays cause most of the problems
  – UVA & UVB
• The sun’s reflective powers are great
  – Sand 17%
  – Snow 80%
Sun Protection

• Both UVA and UVB cause suntan, sunburn, skin cancer and sun damage
• UVA – more aging/cancers
• UVB – more burning
  – Blocked by window glass
• There is no "safe" UV light
  – no such thing as a safe tan
“Suntan”

• A suntan is the skin’s response to an injury
  – A defense mechanism!!

• As the sun’s rays penetrate the skin:
  – skin produces more pigment as a response to the injury
  – But it also changes the skin’s structural framework causing wrinkling and texture changes!
  – *Tanning to improve appearance is ultimately self-defeating!!!*
Are tanning booths safe?

• Artificial radiation carries all the risks of natural sunlight, and then some
• Tanning booths emit UVA radiation
  – premature aging
  – sunburns
  – skin cancer
  – cataracts
AAD Recommendations

- Avoid deliberate sunbathing
- Wide-brimmed hat and sunglasses
- Wear protective clothing
  - White T-shirt -- SPF of 3
  - Tighter weave, darker color --> more protective
  - Hat, sun glasses
- Seek shade whenever possible
- Plan outdoor activities before 10 am and after 4 pm
- And.........
Sunscreen!!!!

• When outside: Broad-spectrum sunscreen with an SPF of at least 15 even on cloudy days
  – Reapply frequently!
    • every 1 to 2 hours
    • more often if swimming or heavily perspiring (even if “water proof”)

• Broad-spectrum sunscreen, at least SPF 15, **DAILY**
  – Moisturizer and make-up
Sunscreen

- Apply 30 minutes before going outdoors
- Apply generously and evenly

One ounce (enough to fill a shot glass) covers exposed areas
Sunscreens work by absorbing or reflecting the sun's rays

Look for expiration date
SPF = Sun Protection Factor

- Range from 2 to > 50
  - SPF 30 is much better than 15
  - Not much difference between 45 and 50
- Refers to the product’s ability to protect from UVB rays (burning rays)
- No equivalent measurement for UVA protection
  - Prevention of redness does **NOT** necessarily mean prevention of sun damage
Sun Protection Factor

• SPF 2:
  – No sunscreen -> burn in 10 minutes
  – With sunscreen -> burn in 20 minutes

• SPF 15:
  – No sunscreen -> burn in 10 minutes
  – With sunscreen -> burn in 150 minutes
Sunscreens

- Sunscreens are divided into:
  - Chemical: absorb sun’s rays
    - SUNSCREEN
  - Physical: deflect sun’s rays
    - SUNBLO CKS
Chemical Sunscreen

• Sunscreens that *absorb* UVB rays:
  – padimate O homosalate
  – octyl methoxycinnamate
  – Benzophenone
  – octyl salicylate
  – phenylbenzimidazole sulfonic acid
  – octocrylene
Chemical Sunscreen

• Broad-spectrum sunscreens block UVB and UVA rays:
  – Oxybenzone
  – Avobenzone (Parsol 1789)
  – Benzophenones
  – Cinnamates
  – Salicylates
Physical Sunscreen / Sunblocks

• Physical sunscreens/blocks ("chemical free"):  
  – titanium dioxide and/or zinc oxide  
  – reflect UVB and UVA  
    “broad-spectrum”  
  – can be used by people allergic to chemical sunscreens
Self Tanning

- Safe alternative to the sun
- Available in cream, lotion, foam, and mist
- Contain dihydroxyacetone
  - interacts with proteins in the skin to produce a brown color
- Fades with time (4-7 days)
- Does not offer sun protection
  - Must still use a sunscreen
Can you believe this maniac?

No sunscreen.

One in five Americans will develop skin cancer. Don’t be the one.