
Skin Cancer and Precancerous Lesions

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General references for this presentation is Donham
and Thelin, [Agricultural Medicine](#), 2016, Chap. 4

Sun Induced Dermatoses



"Here comes the Sun" The Source of Life (and some pain)



UV Radiation (100 nm – 400 nm)

- **UV = 10% of sunlight energy (77% filtered by atmosphere)**
- **UVC: 100-290 nm**
 - highest energy, bactericidal, mostly filtered out by the atmosphere ozone layer
- **UVB: 290-320 nm (SPF ratings are UVB)**
 - High energy, partially filtered by ozone layer
 - 5% of solar radiation
 - 85% cause of sunburn, photo-ageing, cancer
 - Effective – long term tanning
- **UVA: 320-400 nm**
 - 95% of solar rad.,
 - 15% cause of sunburn, photo-ageing, cancer
 - miliaria rubra)
 - Short term tanning
- **Tanning Beds = 95% UVA, 5% UVB**

Sun Burn

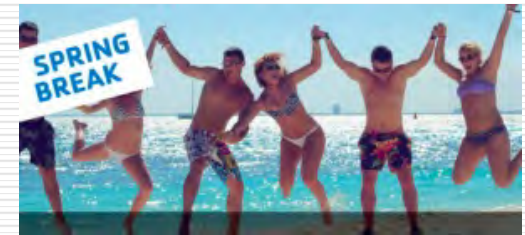
- **Mild – Moderate: A bit of pain for a week**
- **Severe:**
 - “Sun Poisoning” (shock)
 - Dehydration
 - Blisters
 - Sx: fever, chills, nausea, vomiting, pain, headache, confusion, fainting.





Additional Acute Sun Exposure Concerns

- ❑ Tetracycline, Doxycycline, Bactrim, and St. John's Wort = EXTRA risk for sunburns.
- ❑ Concurrent skin disease
- ❑ (e.g., psoriasis)
- ❑ Porphyria/lupus
- ❑ Fair, Red Hair complexion
- ❑ ETOH (spring break disease)
- ❑ Photo Contact dermatitis: Sun exposure will change some chemicals to become sensitizers, or irritants (see previous section),

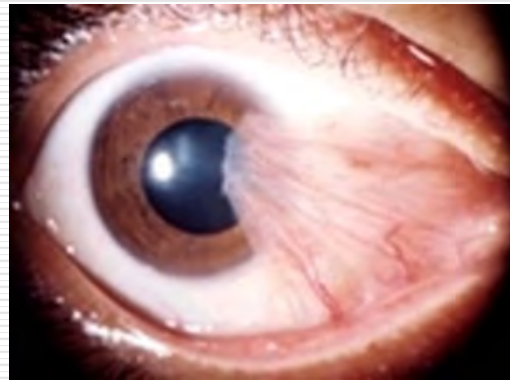


Sun Can Cause Eye Damage

❑ **Chronic - Cataracts**



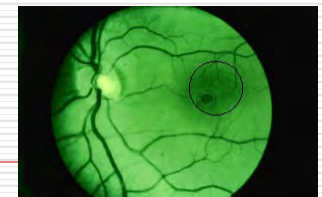
❑ **Pterygium**



❑ **Acute- photokerratitis
(flash burn or welder's
burn – Mainly UVB)**



❑ **Look for sunglasses with 400 Spf**

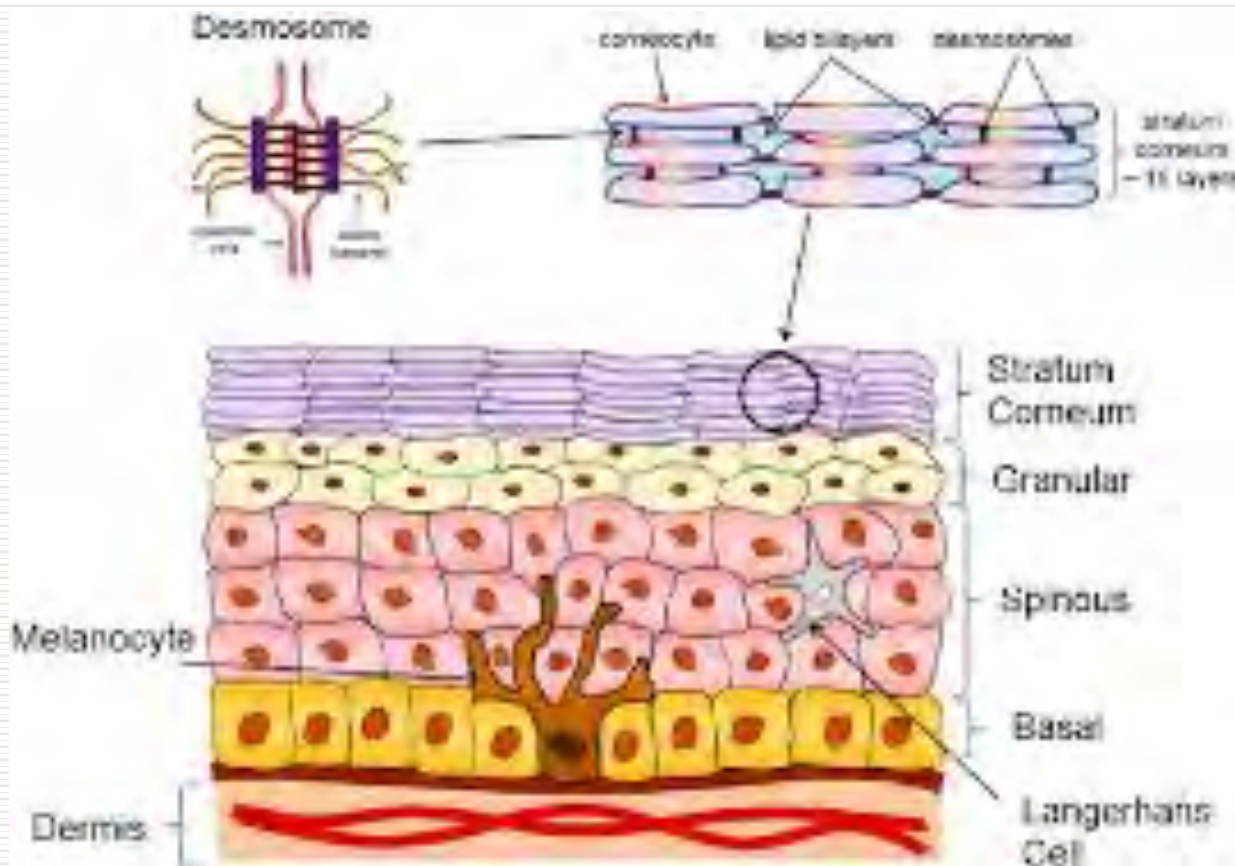


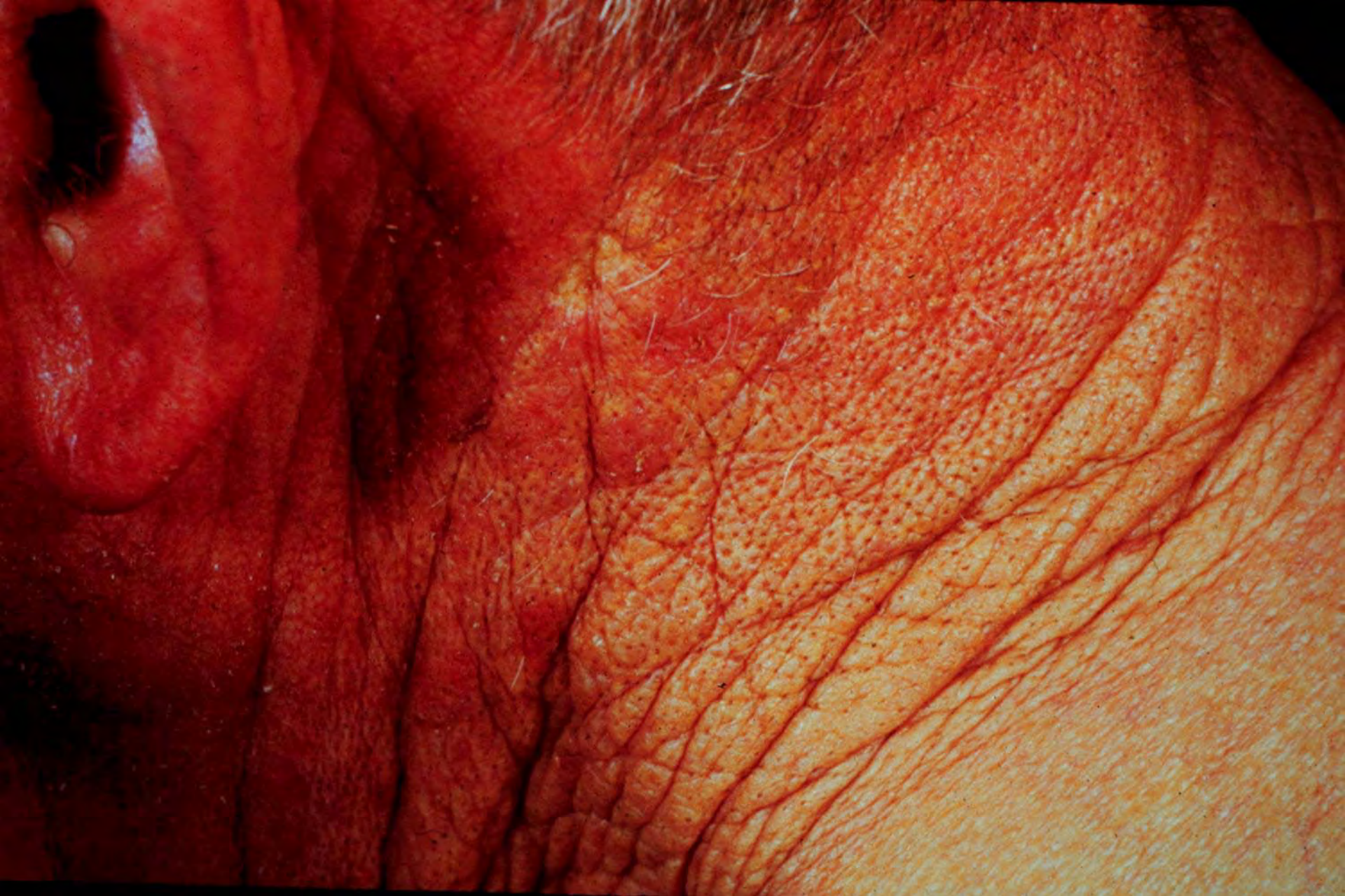
■ Phenylephrine Hydrochloride 0.12%.

Chronic Sun Induced Changes:

- Wrinkling**
- Actinic Keratoses**
- Actinic Chelitis**
- Squamous cell carcinomas**
- Basal cell carcinomas**

Sun effects the Epidermis





Note the excellent example of the normal skin below this 65-year-old farmers' collar and the thickened, wrinkled skin (sun exposed) above the collar.



Can you point out the sun induced lesions? What are they?

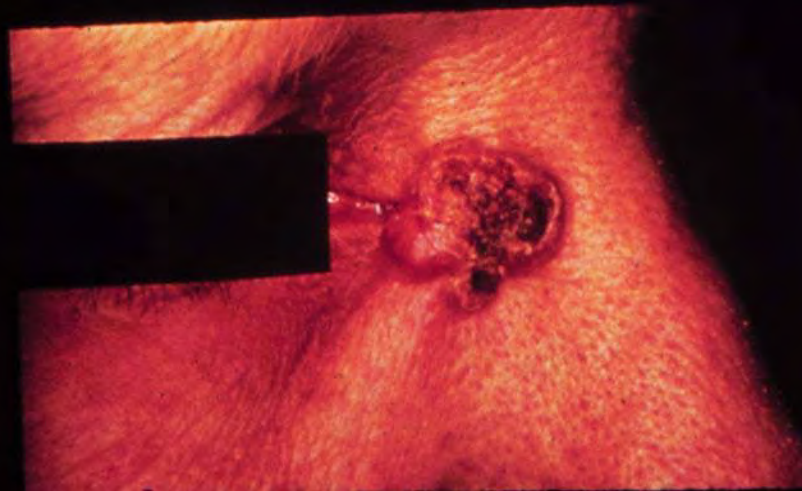
Chelitis (aka farmers lip)– Actinic Keratosis Affecting the lower lip







The basal cell carcinoma is the most common skin cancer. Note the "crater-like" appearance of this lesion. With a closer view you could see blood vessels feeding (telangiectasis) the "base" and the "rim" of the crater. Rarely is this cancer life-threatening. However, this cancer may interfere with the tear duct, and cause a chronic tearing problem for this person. Therefore, this one should be removed early to prevent local destruction of vital structures.



This picture shows the several different appearances of a basal-cell carcinoma. The classic "crater" with rolled edges on the lower part of the picture, the thickened macula 16 (upper left), and the "developing crater" on the upper right.

Metastasis

(squamous cell carcinoma):



BUT – when on LIPS:



MELANOMA

Risk factor = The frequent sunburns- especially early in life,

Malignancy Varies with

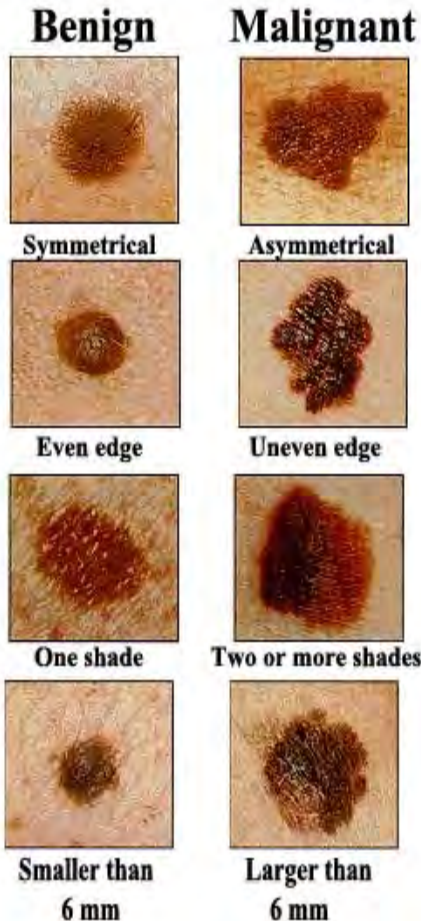
- Type
- Diameter
- Thickness
- Color



https://www.medicinenet.com/melanoma_skin_cancer_of_us_senator_john_mccain/views.htm



The ABC & D's of Melanoma



A=Asymmetrical

B=Border

C=Color

D=Diameter

- ❑ Several types of melanoma with varying Malignancy
- ❑ Thickness of lesion related to malignancy
- ❑ Diameter Larger than a pencil eraser?
- ❑ Often on low sun exposed areas (except lentigo melanoma)

□ Vitiligo

Damage to the melanocytes
in the basal layer of the skin.

Causes:

Sun burns

Autoimmune condition

Genetics

Neurological Condition

Treatment:

None

Steroids

Light



Treatment

Sunburn:

- Cool baths – Compresses Burrows soln.
- NSAIDS (e.g., ibuprophen, naproxim)
- Pain relievers (Tylenol, aspirin) or more serious ones
- Topical and or Systemic steroids
- Fluids
- No ointments (infection risk) or topical anesthetics (allergy risk)

Photocontact Dermatitis:

... As in Contact Dermatitis

Don'ts for Sunburn Treatment

- Don't wash with harsh soaps
- Don't apply petroleum or thick oily products such as Vaseline, or butter (risk for infection)
- Don't apply lidocaine (risk for allergic reaction)

Treatment of Skin Cancers

Actinic Keratoses:

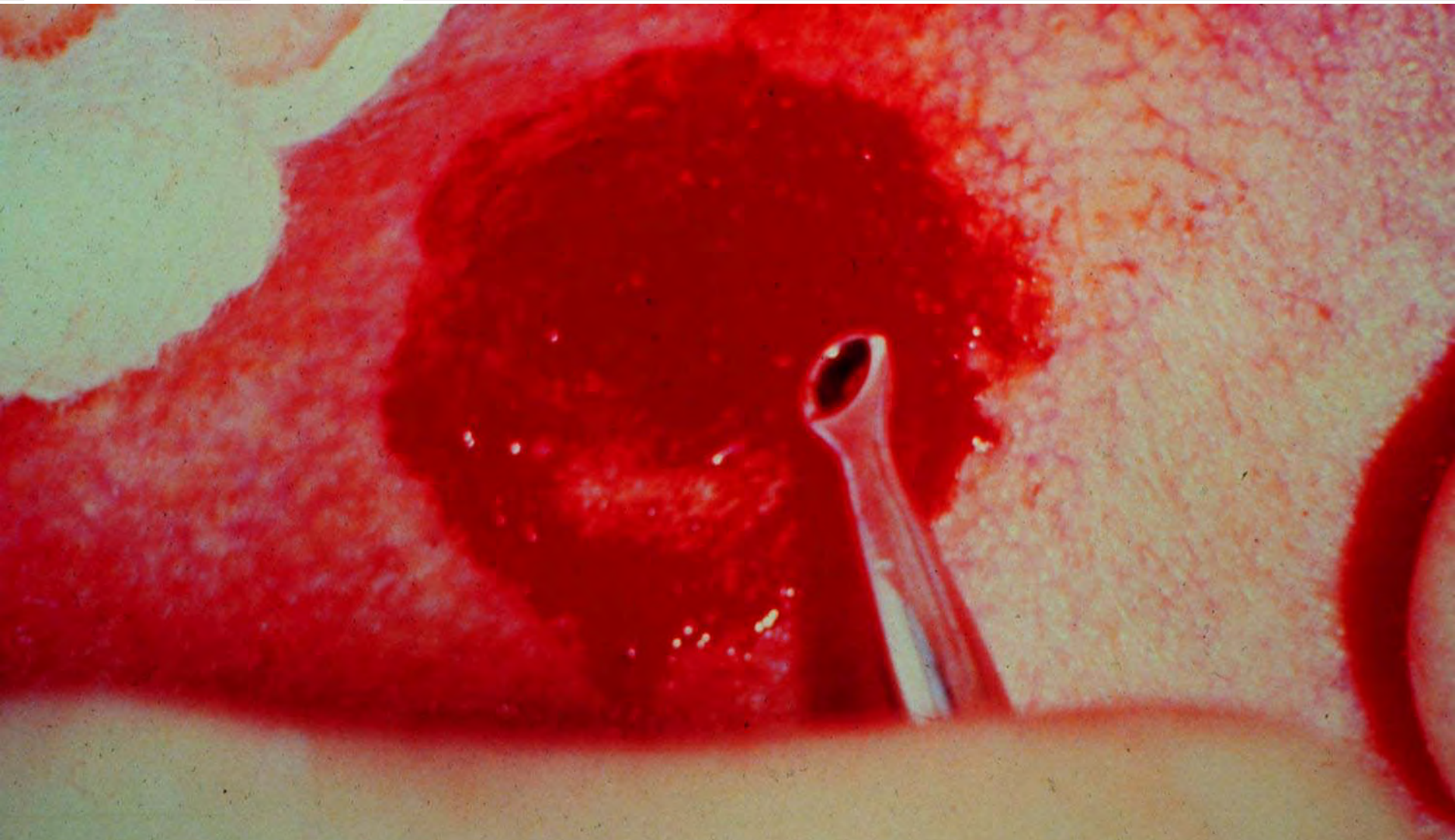
5- Fluorouracil liquid

Nitrogen freezing

Basal Cell or Squamous Cell Sarcoma:

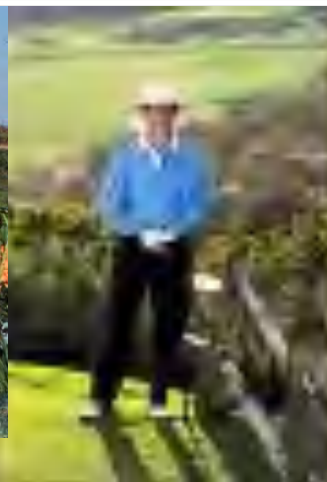
Curettage + Electro-desiccation

Nitrogen freezing



Moh's Surgery

Sun Protection Options: Clothing, Sunscreen



Photoprotective Materials

- **Two basic types of topical sunscreens:**
 - **Absorbers of UV radiation**
 - Para-amino benzoic acid (PABA), cinnamates, salicylates and benzophenones
 - **Reflectors of UV radiation**
 - Titanium or zinc oxide
 - **Clothing blocks 20% of UV or SPF 6**
 - **Antioxidants**
 - **Vitamins E and C**
 - Enhance the ability of skin cells to repair damage induced by UV radiation.
-

Sun Protection Ratings Becomes More Complicated in 2009



SOURCE : FDA/CENTER FOR DRUG EVALUATION AND RESEARCH, 2007

- SPF = sunburn protection factor**
 - UVB measure**
 - Ratio; time to “redness” with and w/o protection**
 - SPF 15 adequate**
- 5 star rating**
 - UVA, 5 star= highest**
- FDA – no longer all day or waterproof**
- Apply early and often (like voting)**

Ultra Violet light + Magnification a good teaching technique for sun damage



[J Am Acad Dermatol. 2012 Oct;
67\(4\): 587–597.](#)

Skin Cancer Screening – takes some training



Thanks for your attention

Lets keep them
healthy and alive!

Questions?

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Sun and Skin Damage Quiz

1. Which of the following drugs when taken internally does not increase the risk for sunburn?

- Penicillin
- Tetracycline
- Bactrim
- Doxycycline

2. Which of the following is not a possible risk from excess sun or welding exposure?

- Pterygium
- Photokeratitis
- Cataract
- Retinal detachment

3. Which of the following skin lesion is not a cancer?

- Basal cell carcinoma
- Actinic keratosis
- Squamous cell carcinoma
- Melanoma

4. Which of the following cancers tend to spread and become malignant?

- Basal cell
- Melanoma
- Squamous cell

5. SFP 50 sunscreen is over 3 times as effective for sunburn protection as is 15 SPF

- True
- False