UV Versus the Skin

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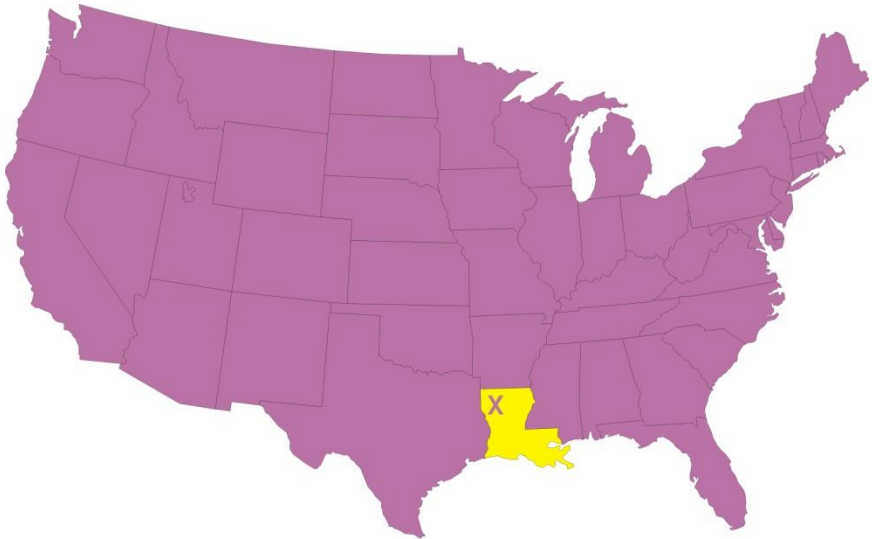
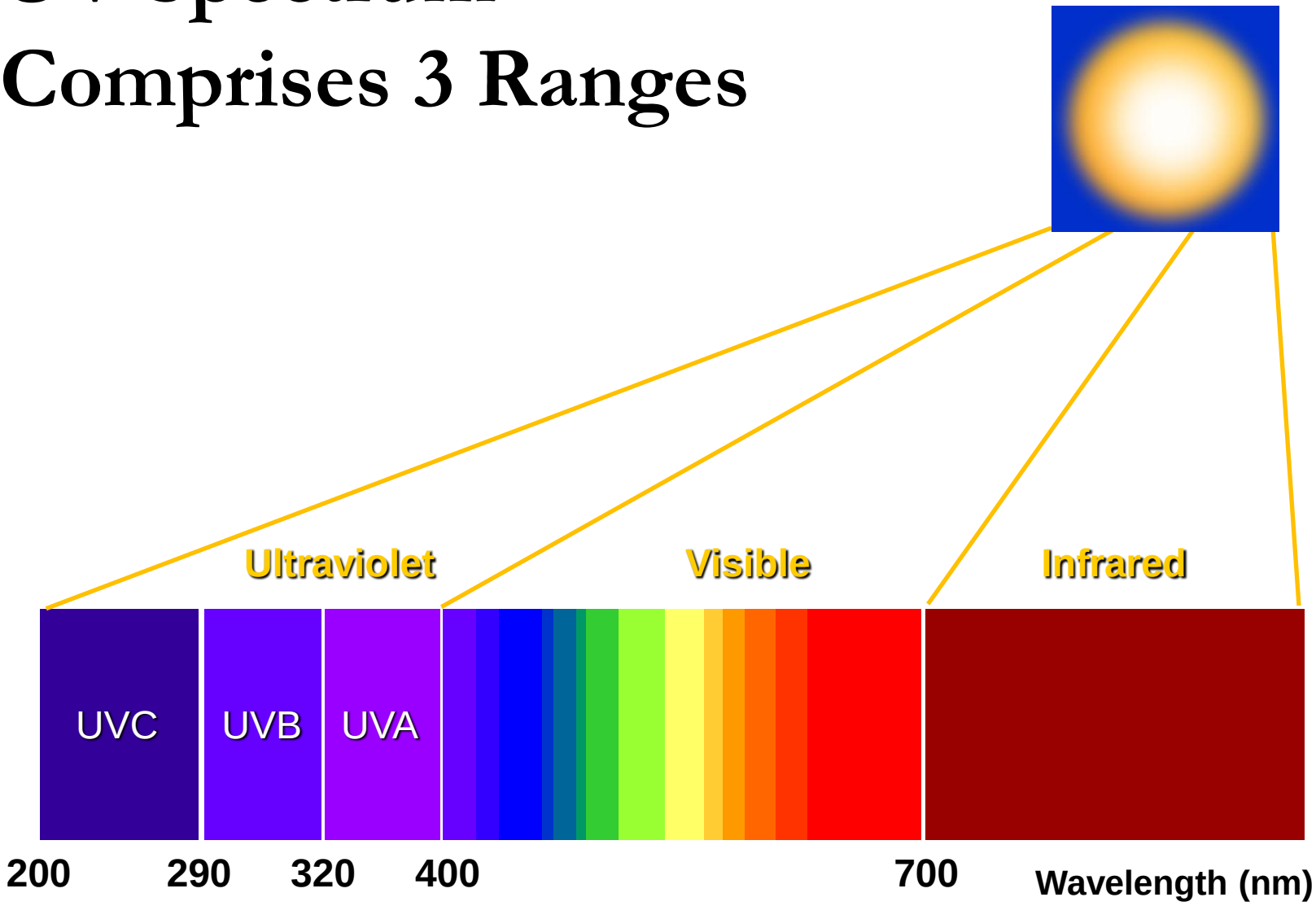
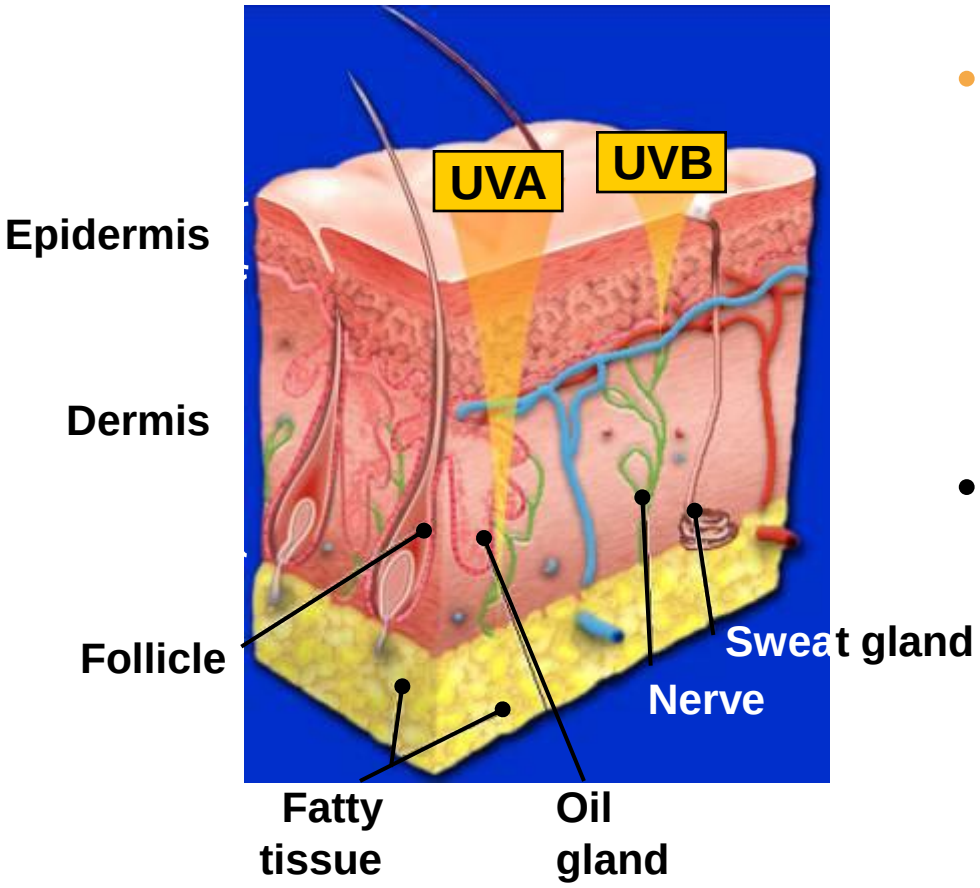


UV Spectrum Comprises 3 Ranges



Kang K, et al. Pathophysiology of ultraviolet irradiation. AAD Web site.

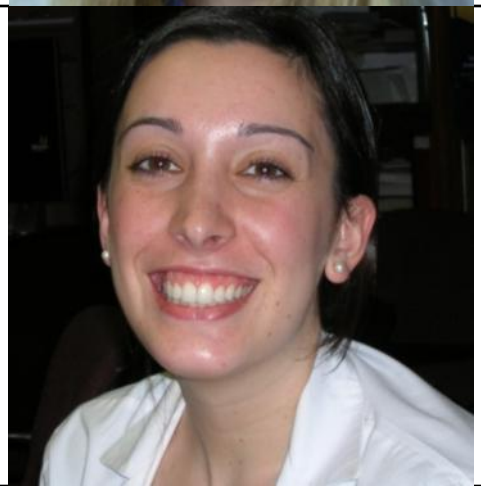
UV Radiation: Acute Effects



- UVA penetrates to deep dermis
  - Not as effective as UVB in causing biological change
  - Darkens skin in 48–72 hrs
- UVB penetrates epidermis to upper dermis
  - Responsible for most biological effects
  - Reddens skin in ~6 hrs

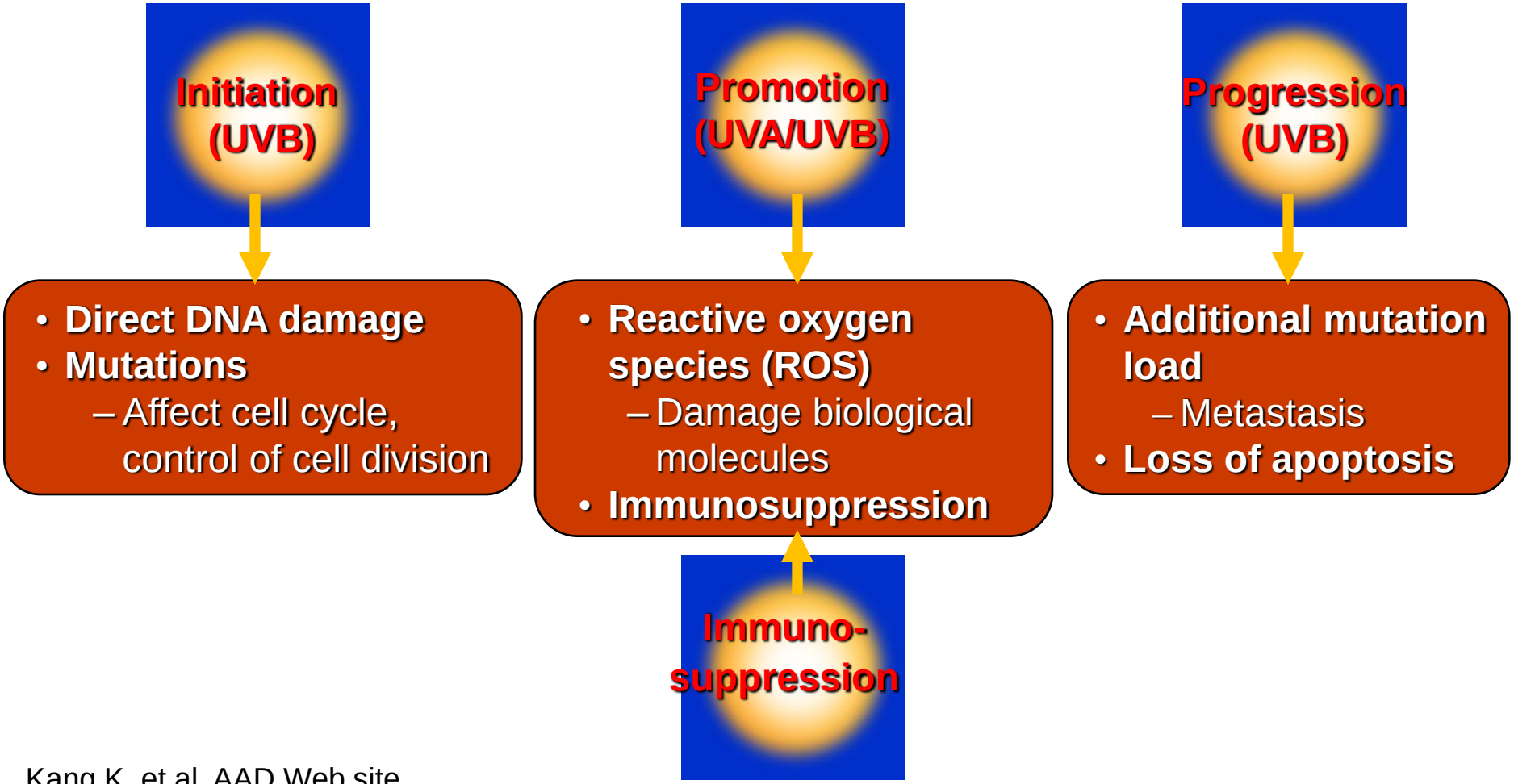
Kang K, et al. AAD Web site.
Gilchrest BA, et al. *J Am Acad Dermatol.* 1981;5:411.

Fitzpatrick Skin Types

I. Pale white skin, blue/ hazel eyes, blond/red hair		IV. Light brown or olive skin	
II. Fair skin, blue eyes		V. Brown skin	
III. Darker white skin		VI. Dark brown or black skin	

- USA

UV Radiation is a Complete Carcinogen



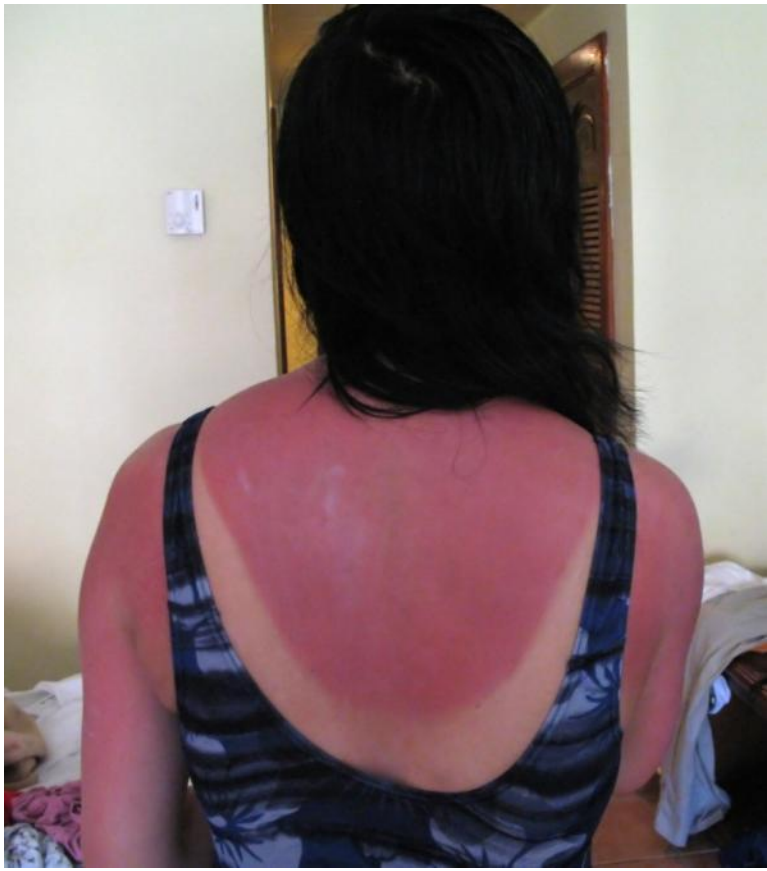
Kang K, et al. AAD Web site.

Grabbe S, Granstein RD. *Chem Immunol.* 1994;58:291–313.

Sander CS, et al. *Br J Dermatol.* 2003;148:913–922. Ullrich SE. *Mutat Res.* 2005;571:185–205.

Sunburn

- 1st degree: symptomatic relief
- Frozen washcloths
- Sarna
- Neutrogena anti itch
- Eurcerin/ Aveeno
- Oatmeal baths
- Topical anesthetics



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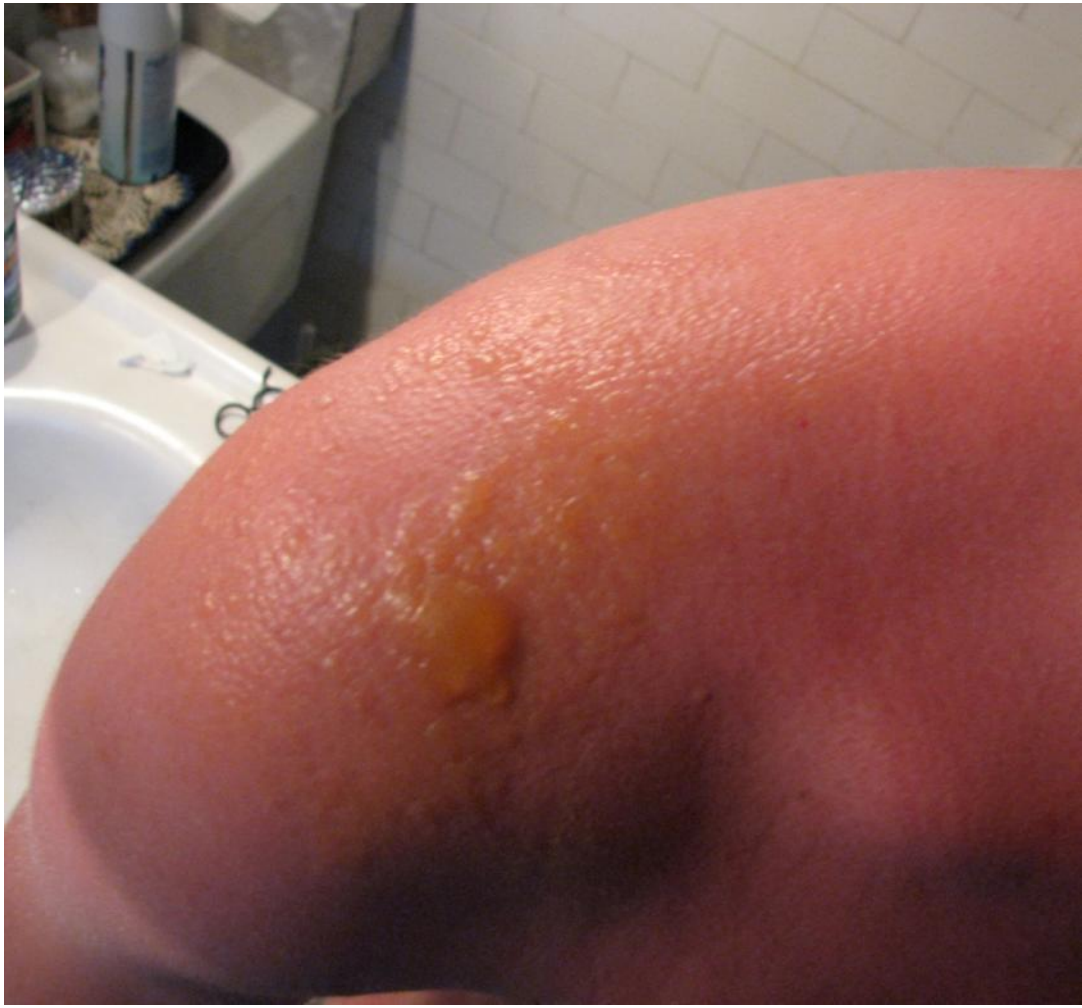
Sunburn

- 2nd degree
- Fluid replacement
- Observation
- Tetanus
- Watch for infection



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Sunburn Management

- Topical and oral NSAIDs appear to decrease erythema <24 hours
- Corticosteroids - Limited data
- Emollients - Limited data
- Aloe vera gel - Limited data
- Topical anesthetics (Solarcaine, Lanacane) - Limited data
- Symptomatic management

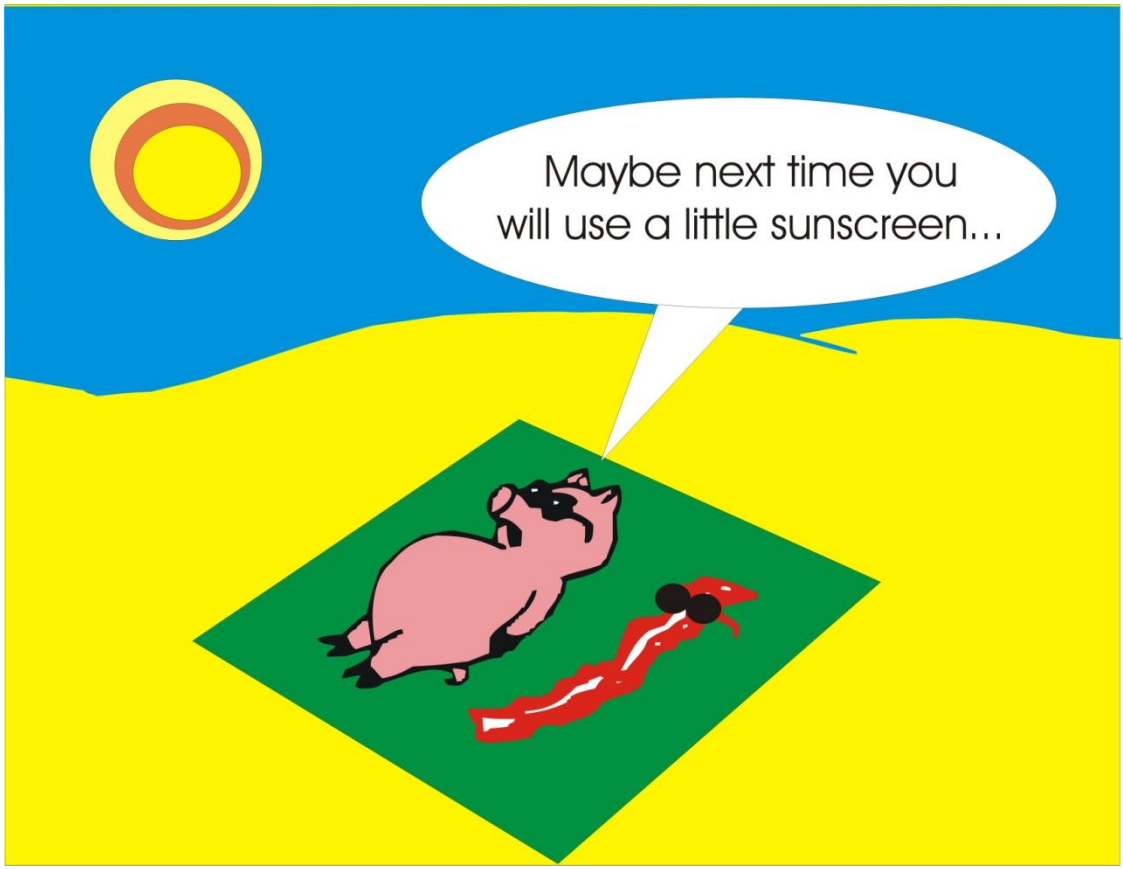
Treatment for Sunburn

Controlled trial topical steroids

- 0.1% methylprednisolone (MPA) and 0.1% hydrocortisone 17-butyrate emulsion (HCB)
- 24 healthy volunteers of skin type III
- Irradiation by simulated sunlight
- Treated 2x daily for 7 days
- Primary outcomes = erythema, edema, burning and itching
- Treated areas significantly lower sunburn reaction areas

Sunburns and Melanoma

- **>5 doubles risk**
- **>15 triples risk**



Sunburn Management

- SPF = measure of ability to prevent erythema in response to sun exposure
- SPF = expected time until minimal erythema using protection
  - SPF 15 product filters 92% of UVB
  - Does not address UVA coverage

Sunscreens

- Primarily absorbs UVB
  - PABA derivatives
  - Salicylates
  - Cinnamates (Allergies!)
- Absorbs UVA and UVB
  - Benzophenones -most rxns
  - Avobenzone (Parsol)
  - Mexoryl (SPF 15 available in U.S.)

Sunscreens

- Physical / inorganic sunblocks
  - UVA and UVB, environmentally safest
  - Zinc oxide
  - Titanium dioxide
  - Iron oxide
- What about Vitamin D?
  - Vitamin D 800-1000 units/day
  - Two to three 5-10 min exposures twice a week of arms & legs OR face, hands, arms

Sunburn Management

- 30g = 1 application for average person
- Duration may be shorter due to:
  - exposure to water
  - perspiration
  - inadequate thickness of application
  - Photoinstability (buy new each year)
- Apply to dry skin 30 min pre-exposure
  - Reapply 30min after start exposure
  - Reapply after 2-3 hours of activity

Tanning

- Is indoor tanning safer?
  - SCC risk 2.5
  - BCC risk 1.5
- Photoaging
- Photoallergic rxns
- Lupus
- HPV?

Self-Tanning Lotions

- Takes practice
- Preferred over “natural tan”
- Not sun protective
- Rare contact dermatitis

"Sun Sense"

- Photoprotection
- Avoiding sun exposure between 11:00 AM and 2:00 PM
- Wearing of sun-impermeable clothes and wide-brimmed hats
- UV passes through
  - Clouds
  - 3 feet of water
- No "extra" UV via tanning beds

Sun Protective Clothing

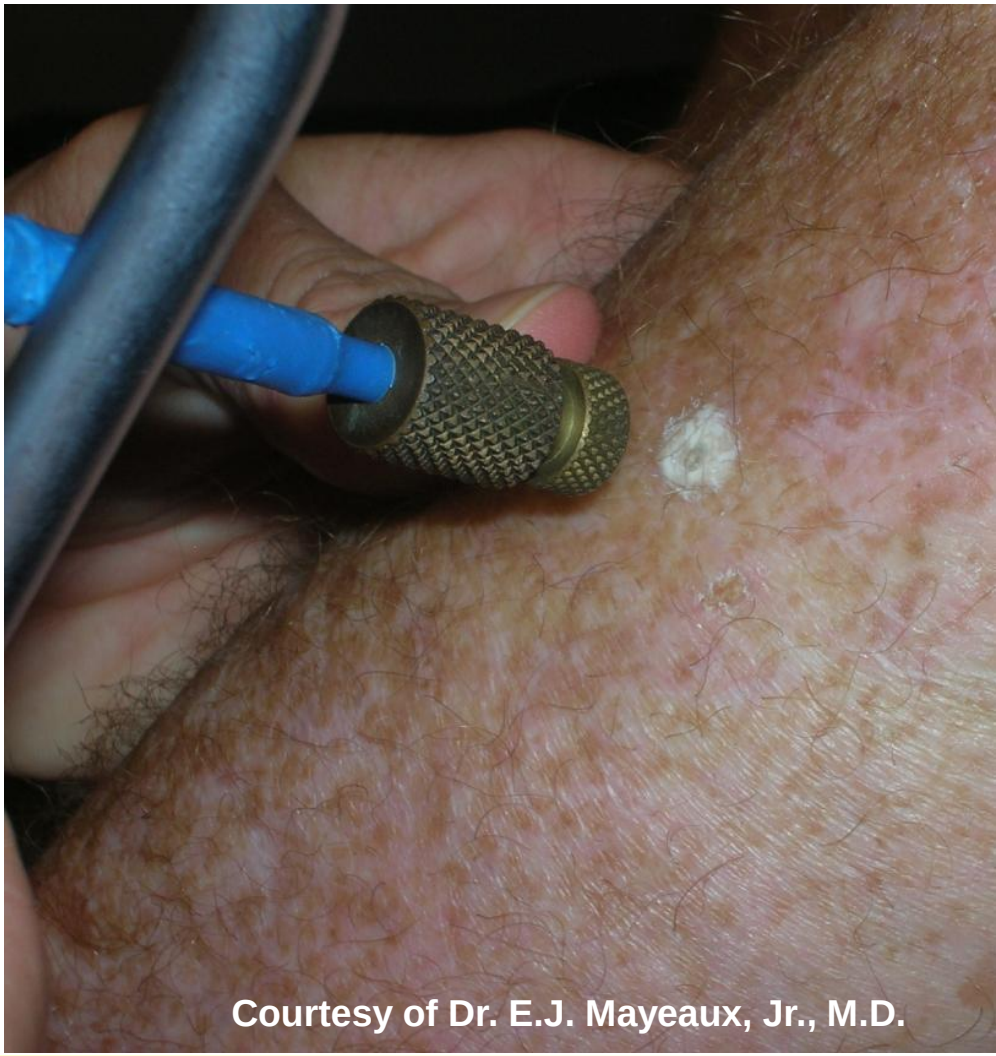
- **Spf <15 when clothing wet**
  - **Weave of the fabric**
- **Special clothing/laundry additives**
  - **Sunguard by Rit**
  - **Sunprecautions, LL Bean**
  - **Hanes Beefy T-shirt**

Actinic Keratoses

- Scaly, cutaneous lesions
  - Caused by sun damage to the skin
  - Exposed body areas such as the face, ears, and dorsum of the hands
  - Premalignant lesions, 2% progressing to SCC/year if untreated
- Often easier to feel than see
- Patient may scrape the lesions off, only to develop bleeding at the site

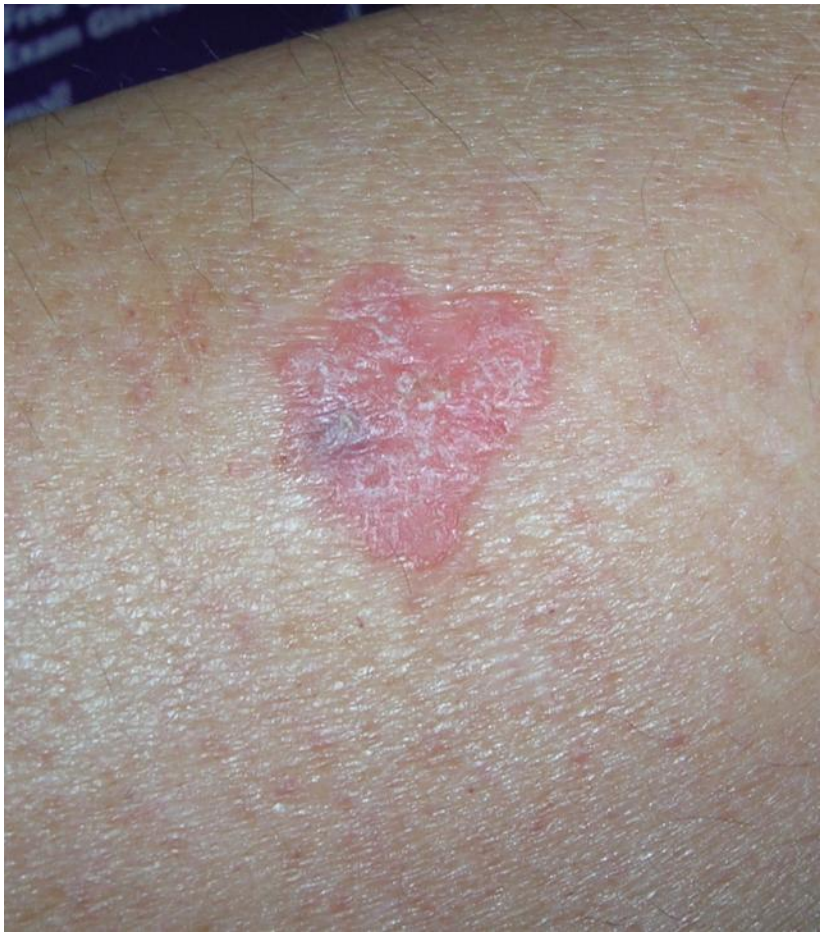
Actinic Keratoses

- Cryotherapy
- 5-FU therapy
- Imiquimod (Aldara)
- Topical 3% diclofenac gel (Solaraze)



Bowen's Disease

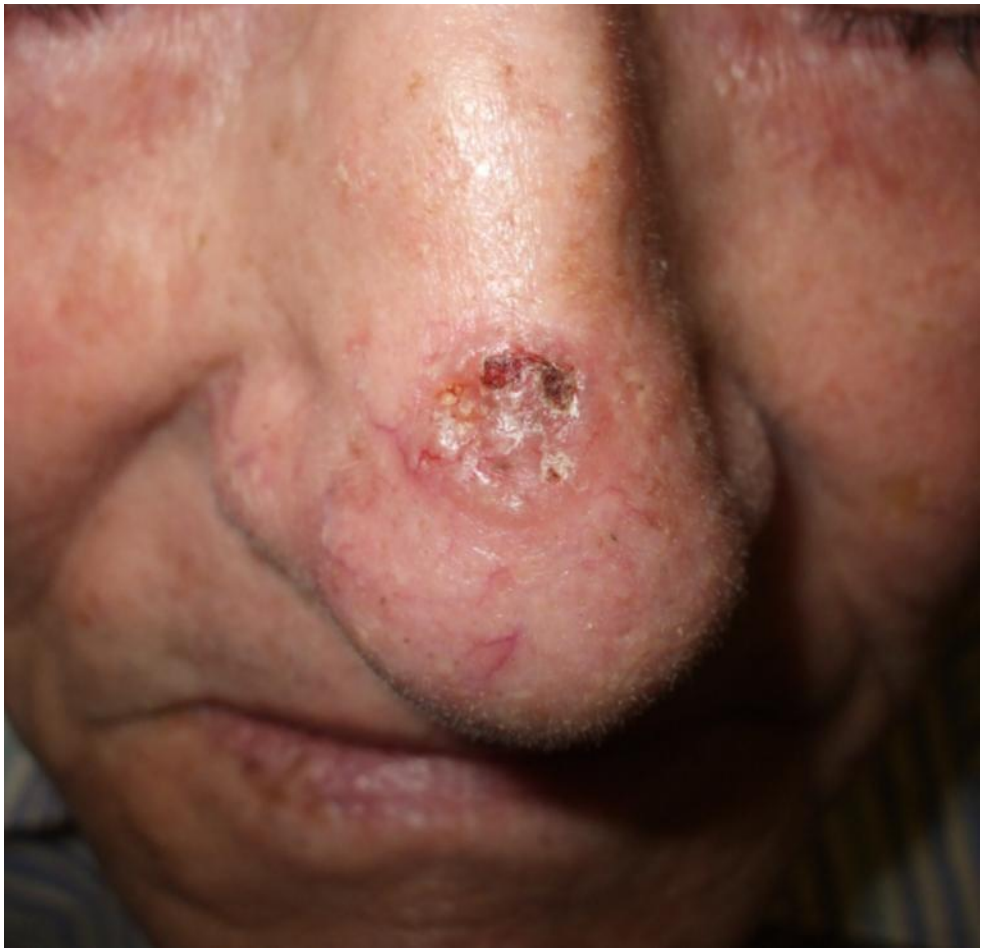
- SCC in situ
- Mainly sun-exposed
- Slightly elevated red scaly plaque with well-demarcated borders
- May resemble psoriasis, BCC, SK
- Tx = cryotherapy, 5-FU, excision, or D/C



Courtesy of Dr. E.J. Mayeaux, Jr., M.D.

Squamous Cell Carcinoma

- SCC 2nd most common NMSC
  - Exposure to UV & skin pigmentation
  - Incidence in women increasing
  - AK conversion ~2%
- Lips, ears, and scalp

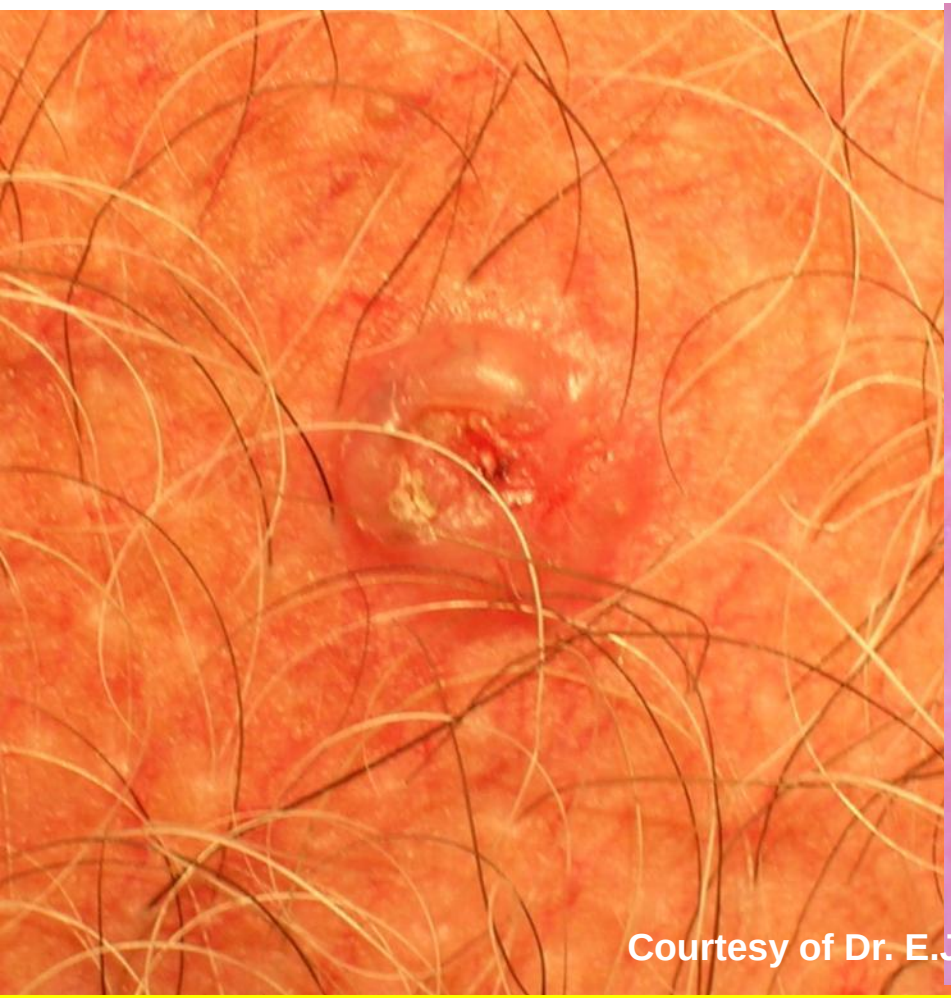


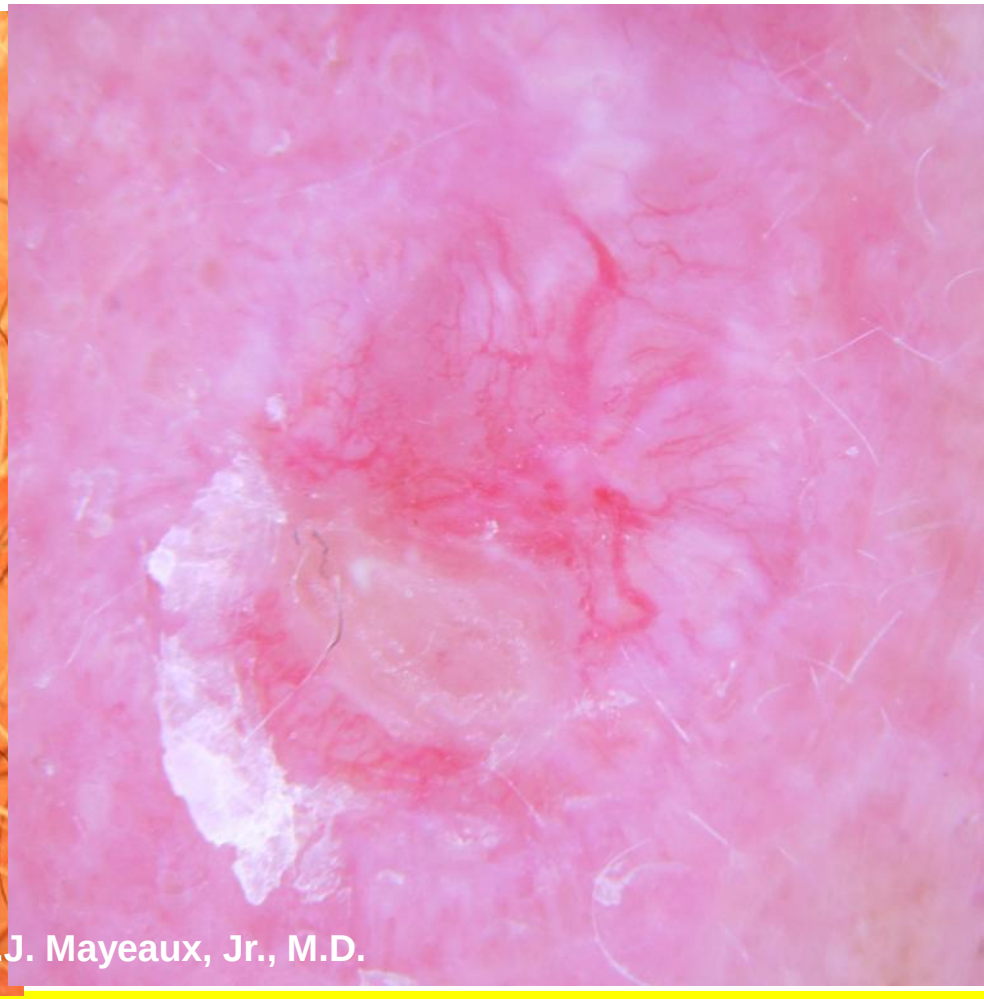
Courtesy of Dr. E.J. Mayeaux, Jr., M.D.

Treatment Options for SCC

- Excision with 6 mm margin
- Curettage and desiccation after a shave biopsy
- Cryotherapy – deep and wide freeze
- Mohs for recurrent SCC and areas of functional and cosmetic importance

Basal Cell Ca





Courtesy of Dr. E.J. Mayeaux, Jr., M.D.

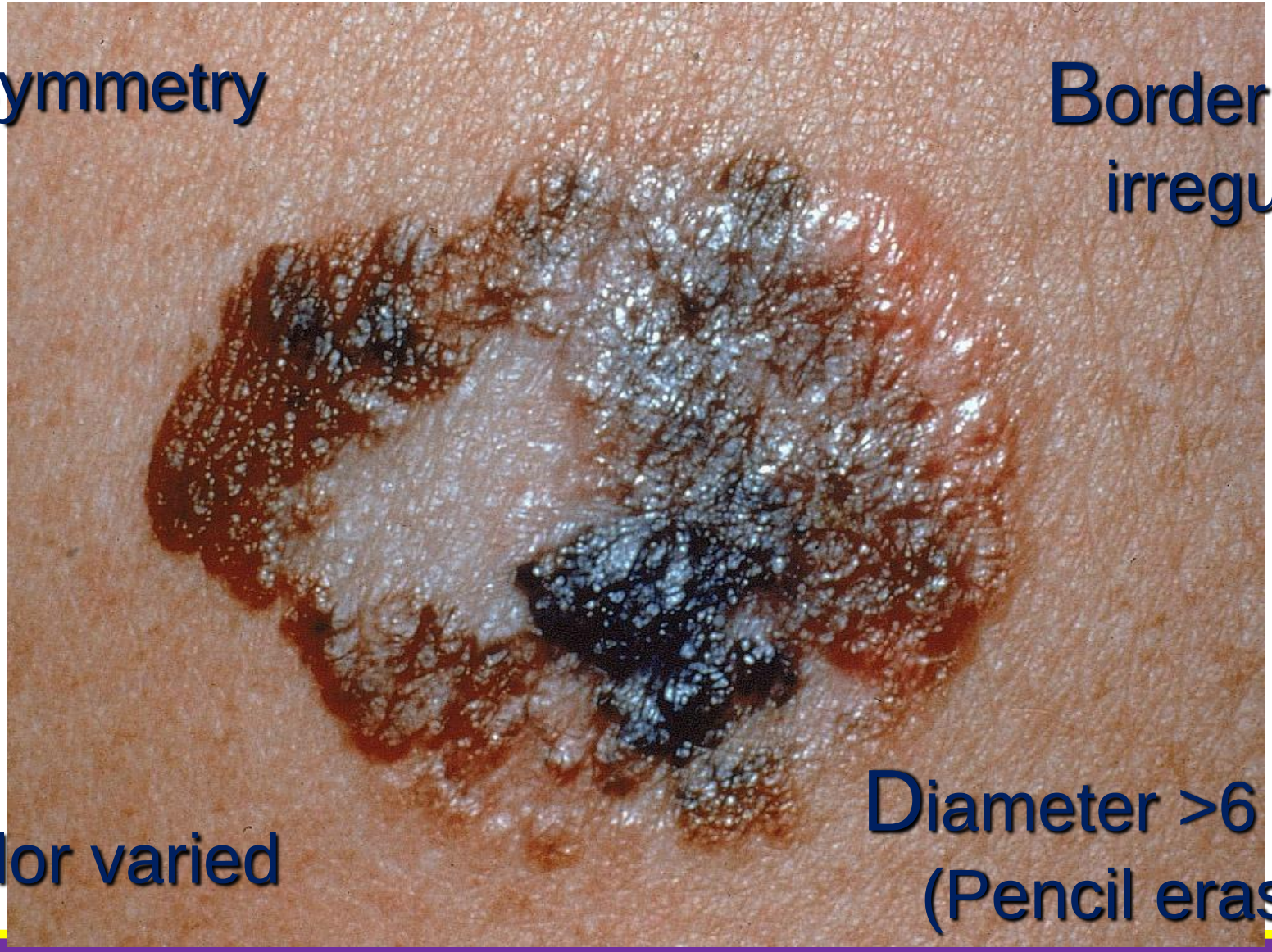
Basal Cell Ca

- Most common skin Ca
- Surgical excision - 3- 5 mm margins
  - Full Thickness vs curettage & desiccation
- Cochrane EBM
  - Cryosurgery = effective BCC treatment
  - Mohs surgery should be used mainly for larger, morphea-type BCCs located in danger zones
  - Smaller BCCs - sx excision tx of choice

Pigmented Lesions

- A pigmented lesion
  - Should arouse some suspicion for the possibility of melanoma
  - Could be precancerous (lentigo maligna), or a simple lentigo or benign lesion
  - Could be pigmented SCC or BCC
  - Because the appearance alone generally is not diagnostic, you should consider a biopsy

ABCDs of Melanoma



ABCD Pitfalls

- 30% of melanomas at the time of diagnosis are < 6 mm in diameter
- 15%-20% of melanomas have a uniform border or uniform pigmentation at diagnosis
- Add ‘E’ for enlargement (expansion) or elevation; changing moles need evaluation
- Add ‘F’ for family history; those with a family history of melanoma at greater risk

MM in Women

- **Distribution of superficial spreading melanoma in women clusters in 2 locations**
  - **Mid-back between the shoulder blades**
  - **Lower legs**
  - **Examine whenever performing health maintenance exams on women**

Habif TP. Clinical Dermatology 1996; 701.

Superficial Spreading Melanoma

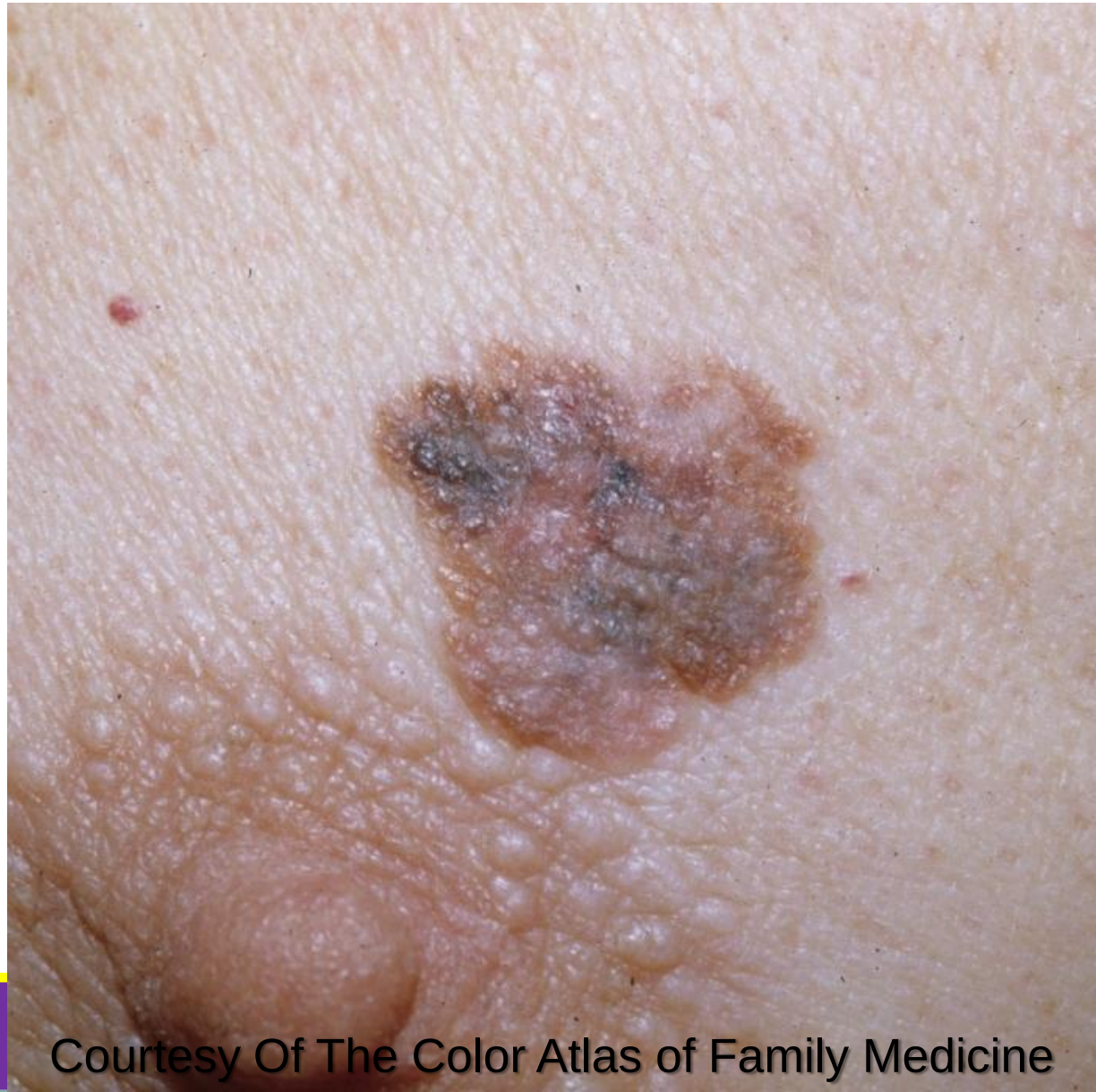
An endless variety of shapes and sizes can be produced by the random migration of cells

Radial (outward) spread and regression

Courtesy Of The Color Atlas of Family Medicine

Superficial Spreading Melanoma

Diverse colors common, but lesions can be uniformly brown or black



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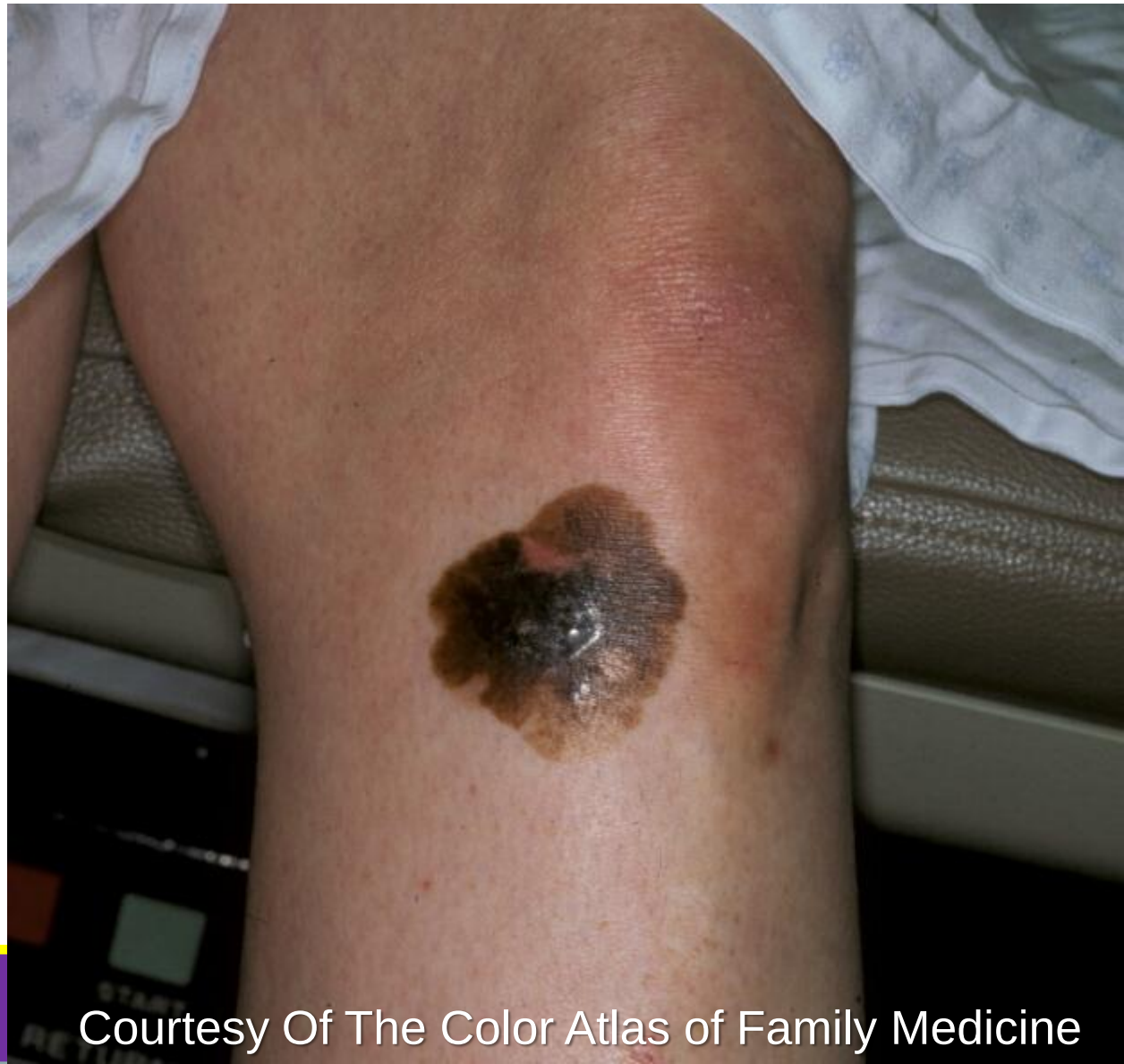
Superficial Spreading Melanoma

- Most often found in individuals in the 4th-5th decades (middle age)



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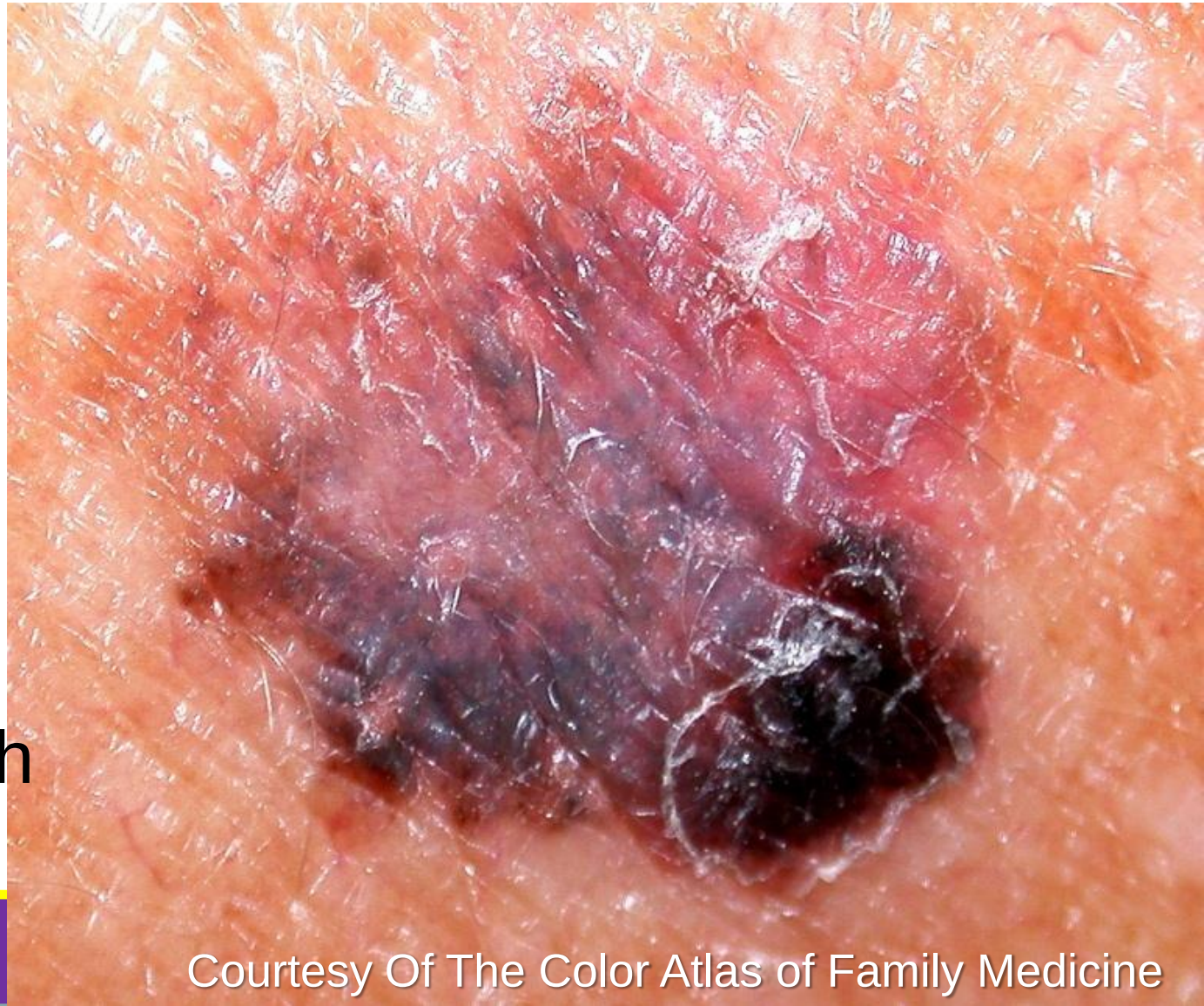
Superficial Spreading Melanoma

- Often develop nodules (vertical growth) once lesion >2.5 cm
- Prognosis worsens with vertical growth



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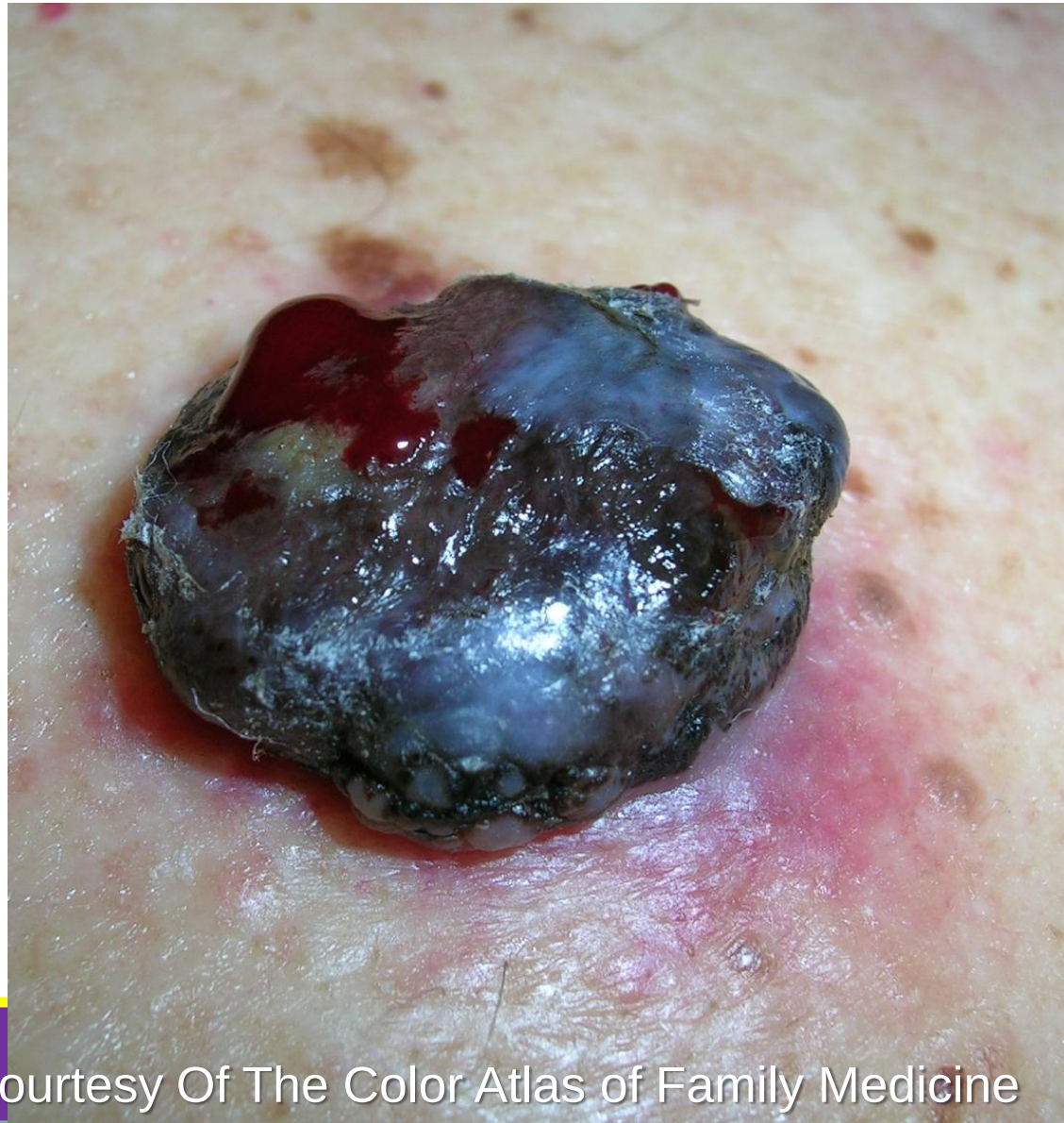
Nodular Melanoma

- Presents as dome-shaped, polypoid or pedunculated lesion
- Dark, stuck-on the skin appearance to this palpable lesion



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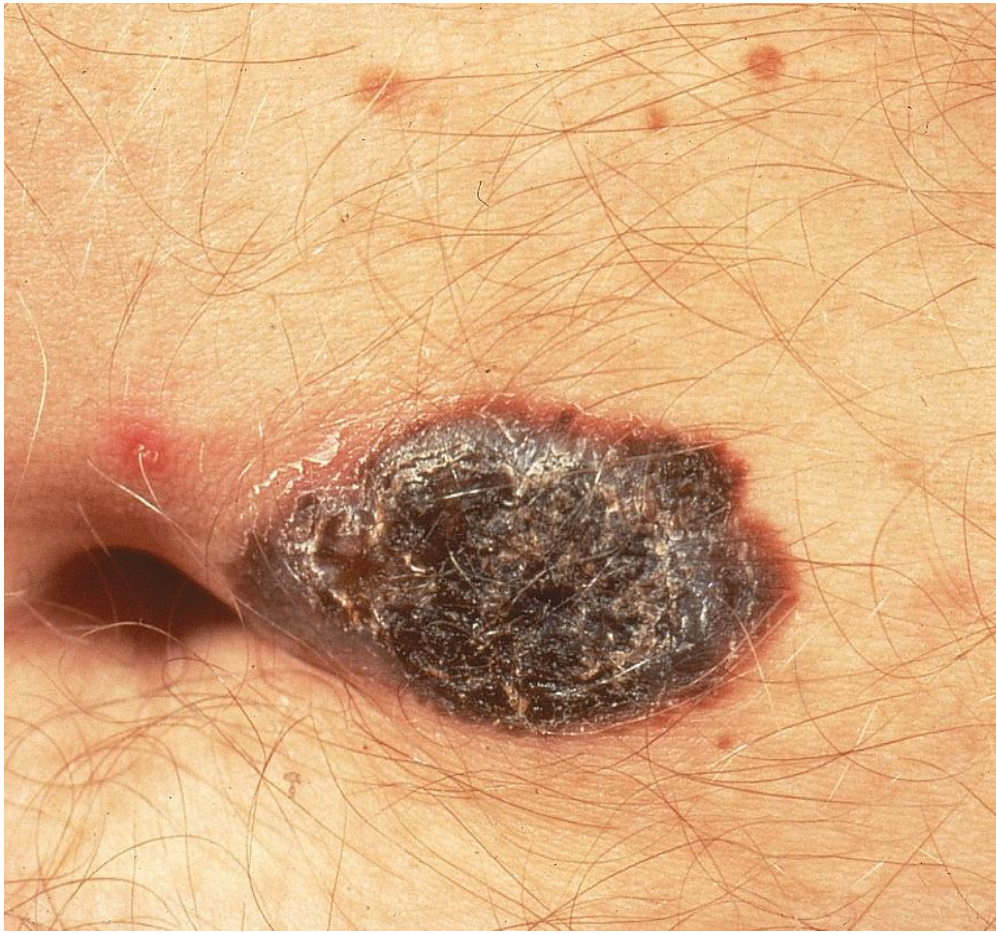
Nodular Melanoma

- Type of melanoma most often misdiagnosed due to resemblance to benign lesions
- Occasionally lesions appearing like benign nevi or hemangiomas



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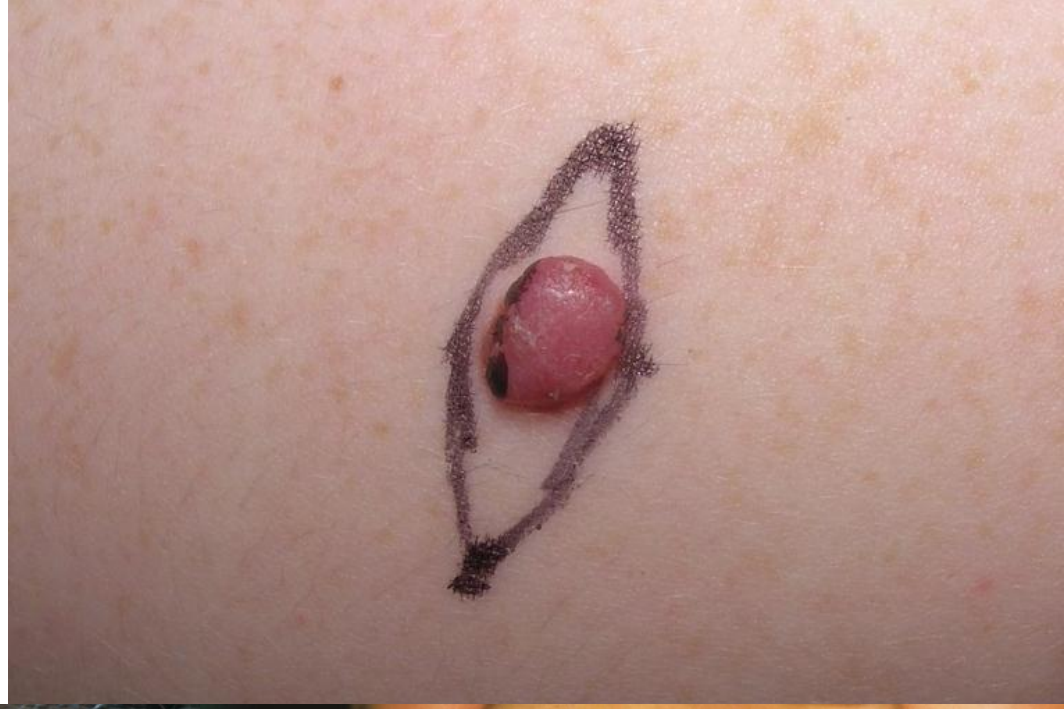
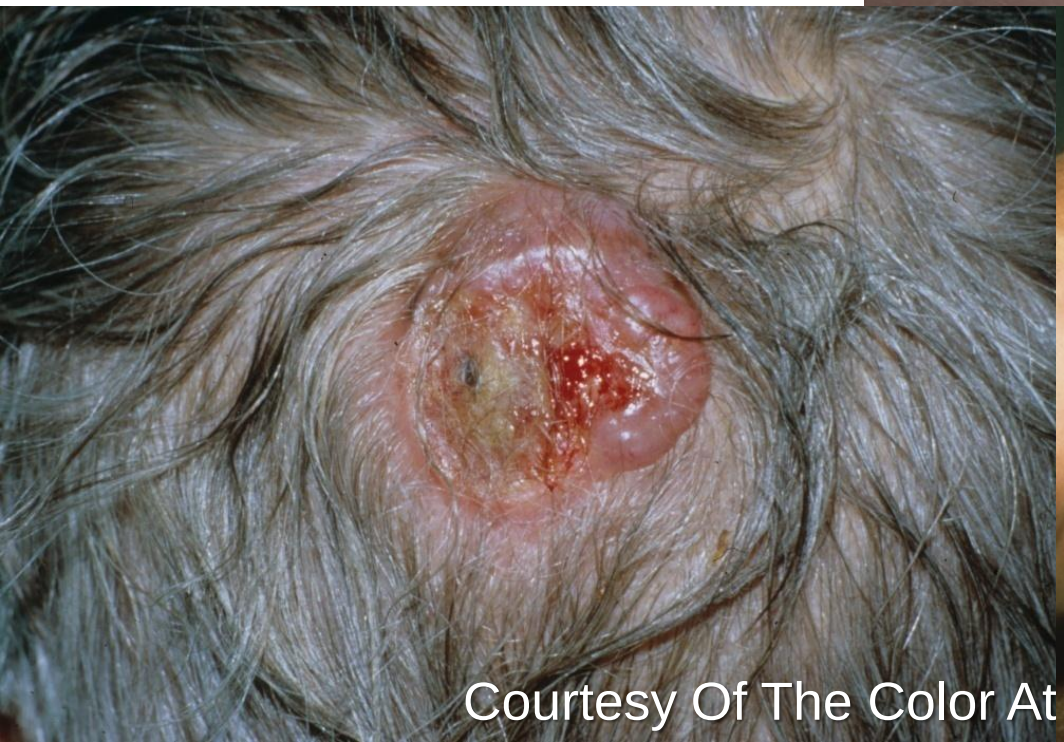
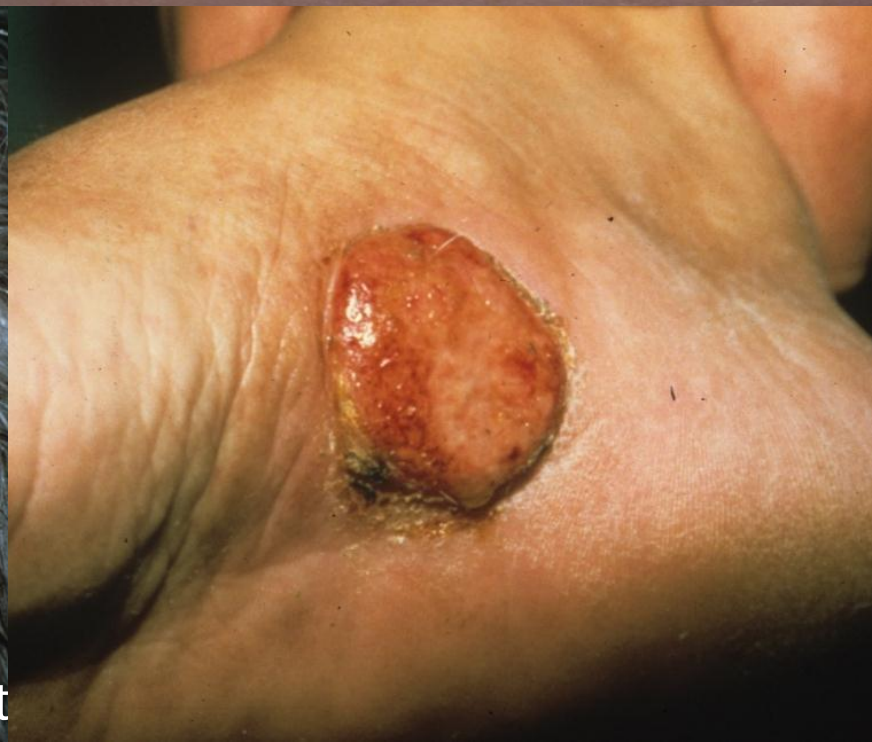
Amelanotic Nodular Melanoma

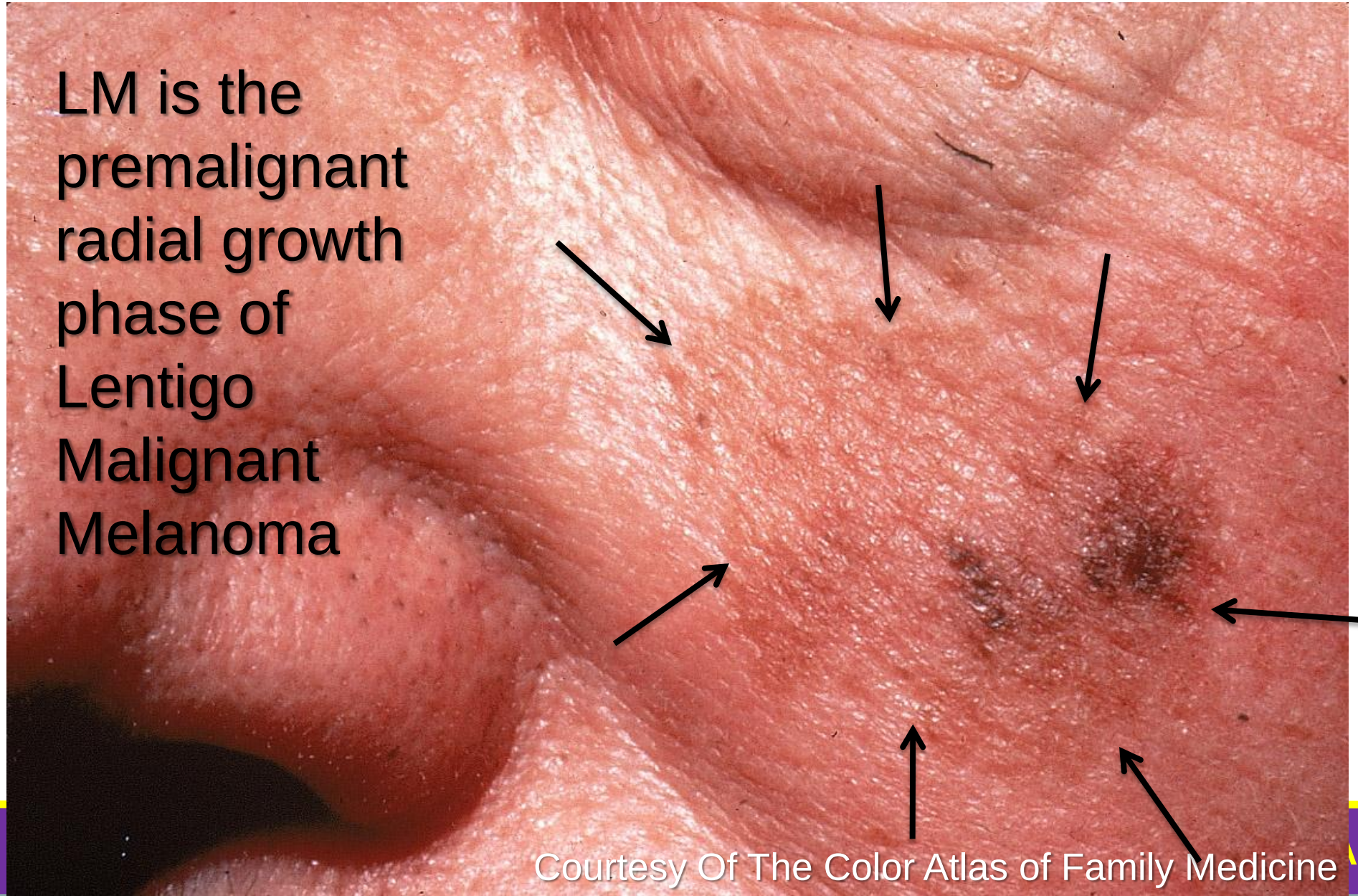






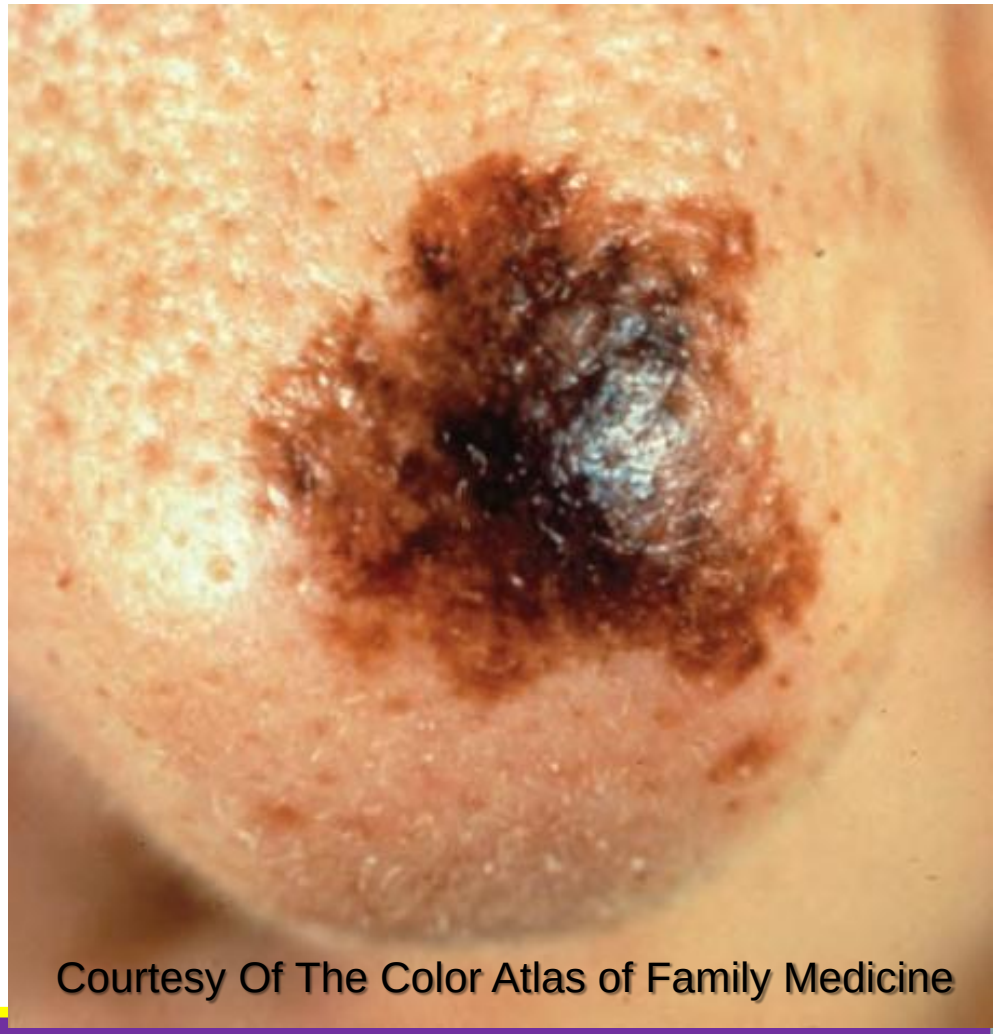
Courtesy Of The Color At

Lentigo Maligna



Lentigo Malignant Melanoma

- Lentigo maligna (Hutchinson's freckle) may last for years and never develop vertical growth phase
- Lifetime risk of progression to LMM is 3.3% for a 45 year old, and 1.2% for a 65 year old



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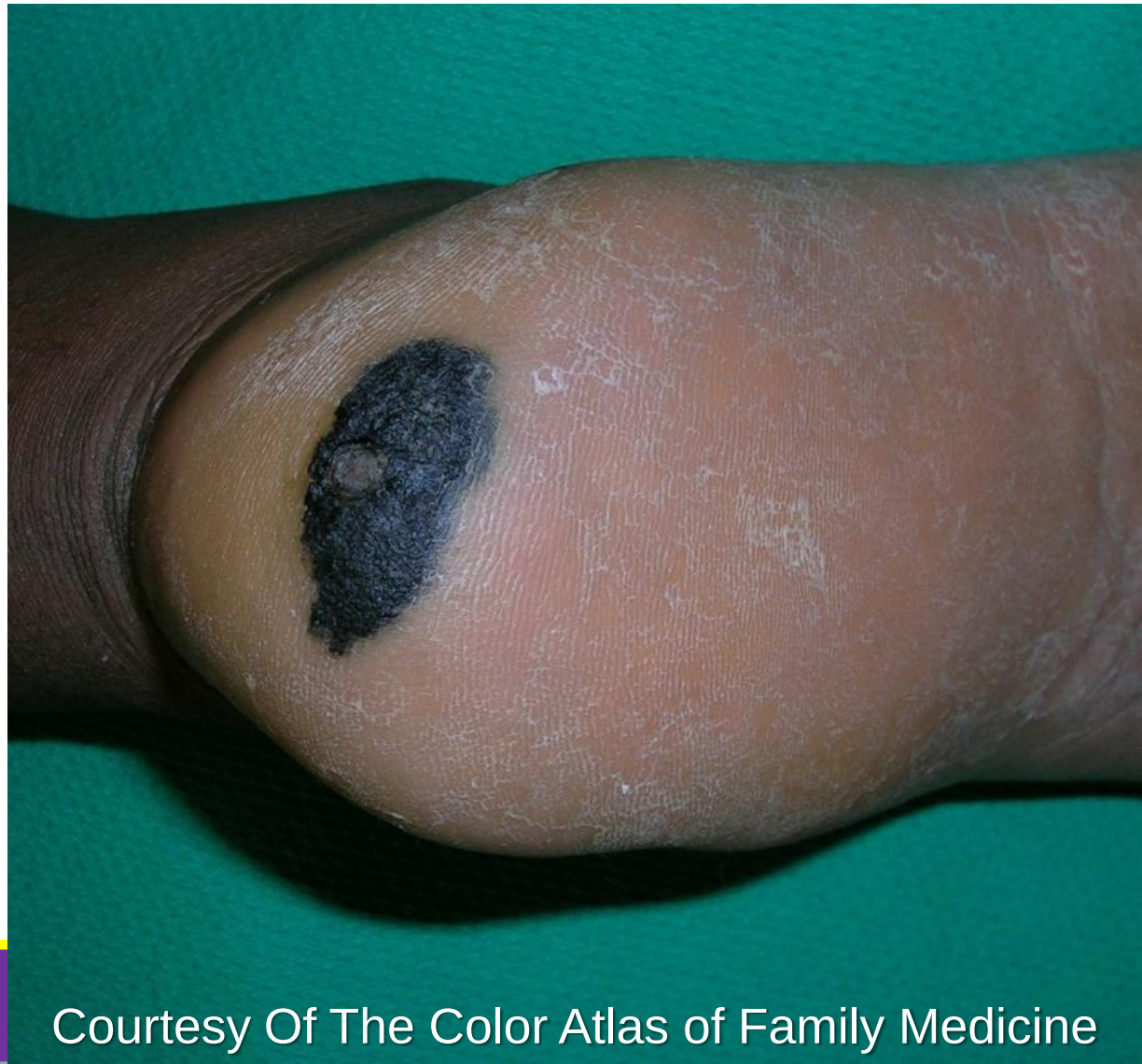
Acral Lentiginous Melanoma

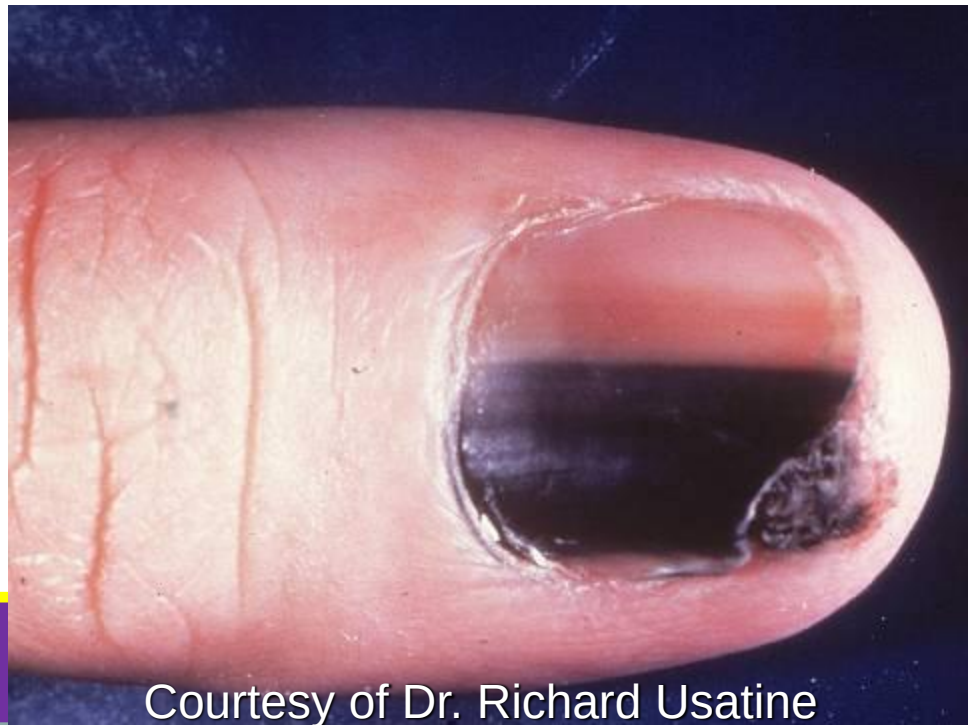
Appears on the palms, soles, terminal digits, and mucous membranes



Courtesy Of The Color Atlas of Family Medicine

Subungual Melanoma

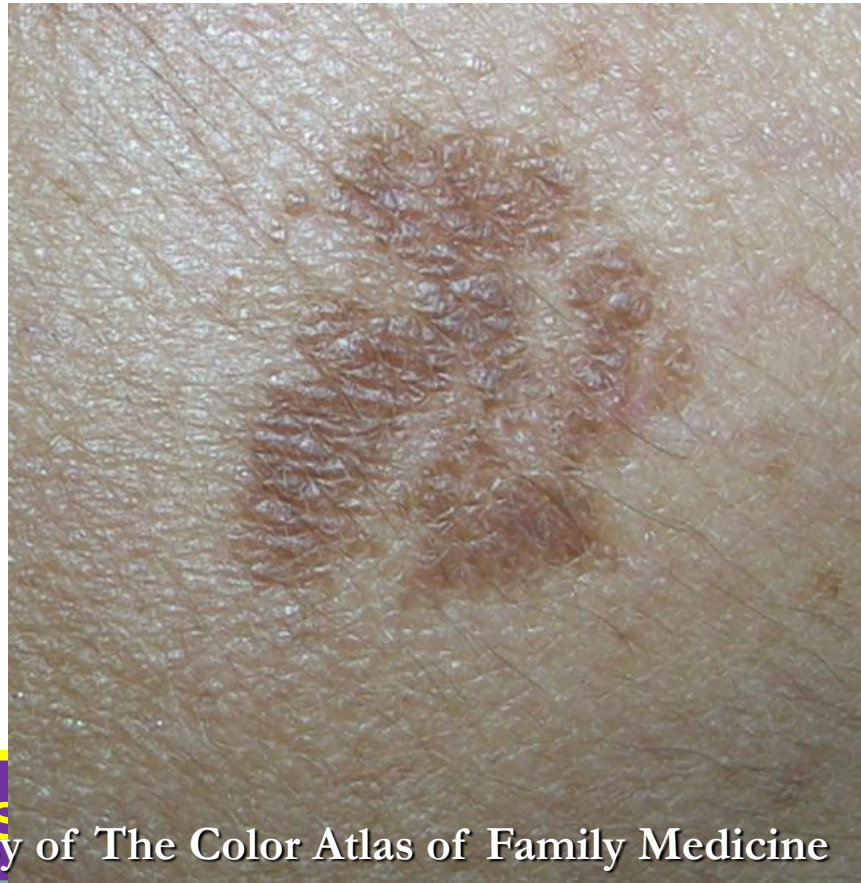
- **Small number of patients with longitudinal melanonychia have subungual melanoma**
- **Separating benign from malignant lesions is often difficult**



Courtesy of Dr. Richard Usatine

Solar Lentigines (Liver Spots)

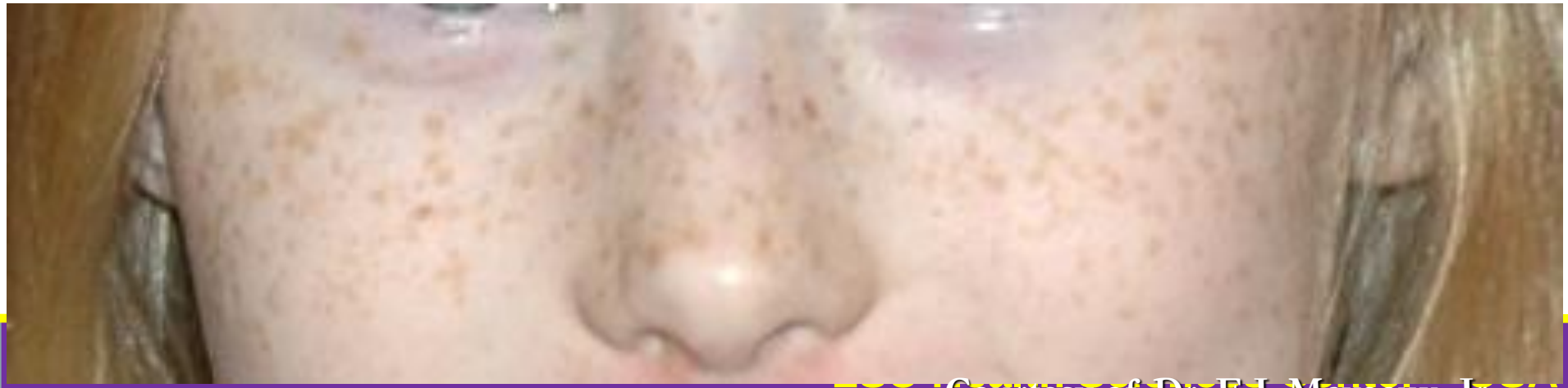
- Macular, 1- to 3-cm, hyperpigmented, well-circumscribed lesions – sun-exposed skin
- Light yellow to dark brown, variegated
- Face, hands, forearms, chest, back, shins
  - Erupt after acute or chronic UV exposure
- Skin types I to III



Courtesy of The Color Atlas of Family Medicine

Freckles (Ephelides)

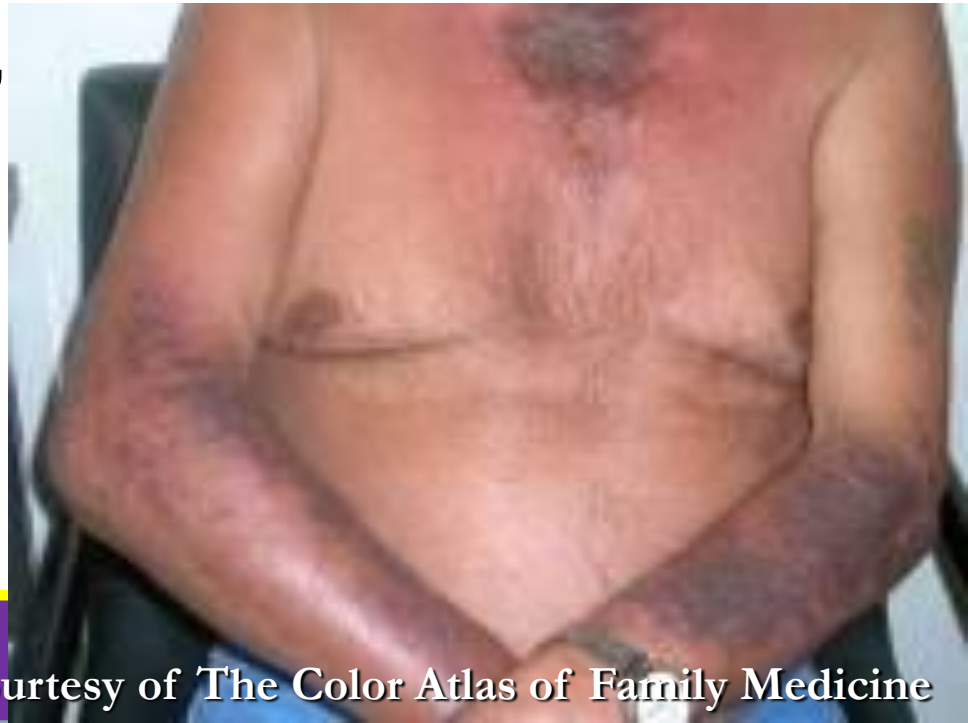
- **Small, 1- to 2-mm, sharply defined macular lesions of uniform color**
  - **Face, neck, chest, and arms**
  - **Red to tan to light brown, few to hundreds**
  - **Onset childhood, asymptomatic**



Courtesy of Dr. E.J. Mayeaux, Jr.

Phototoxic Reactions

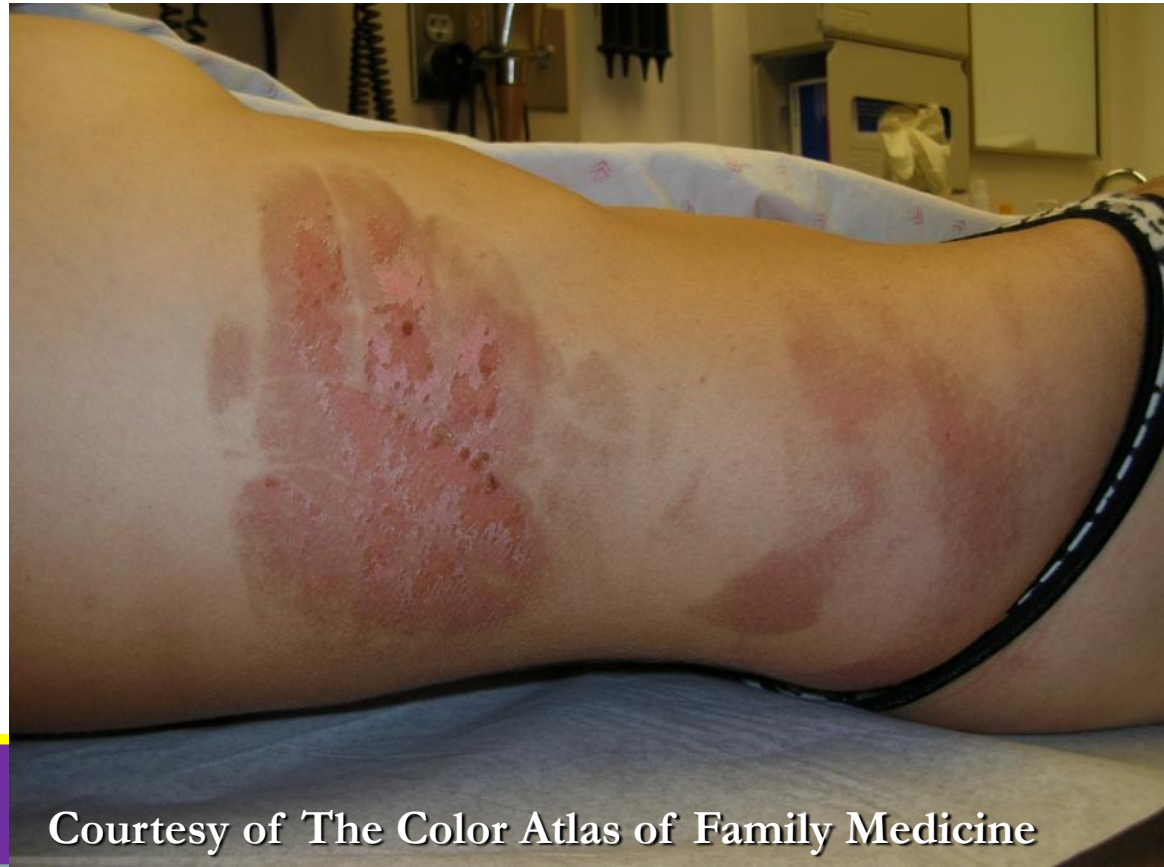
- Most common drug-induced photoeruption
- Drug absorbs UV light
  - Releases energy and damages cell membranes, or for psoralens, DNA
  - NSAIDs, quinolones, tetracyclines, amiodarone, and phenothiazines



Courtesy of The Color Atlas of Family Medicine

Phototoxic Reactions

- Phytophotodermatitis
  - Phototoxic reactions to psoralens
  - Limes, celery, figs, and certain drugs
  - Dramatic inflammation and bullae



Polymorphous Light Eruption

- Diagnosis of exclusion
- Light-induced, pruritic eruption
  - First intense sun exposure of the year
- Diffuse erythema
- Accentuation on the arms and thighs
- Face may be spared