



# Skin Cancer and Its Prevention

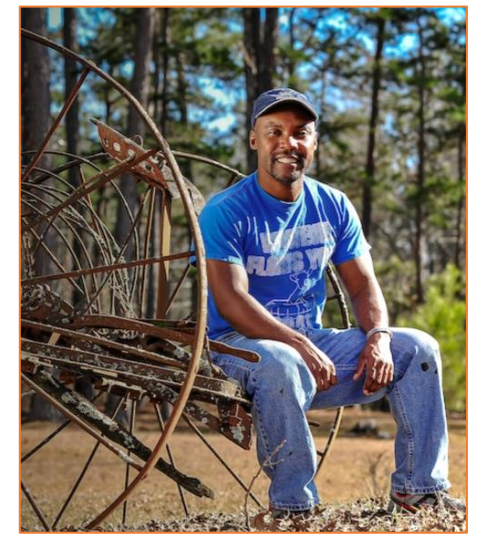
Teledermatology in Rural Georgia Program

# Objectives

- Understand ultraviolet (UV) radiation
- Recognize signs of sun damage
- Learn about common skin cancers
- Learn how to prevent sun damage
- Know about skin safety resources and how to access them

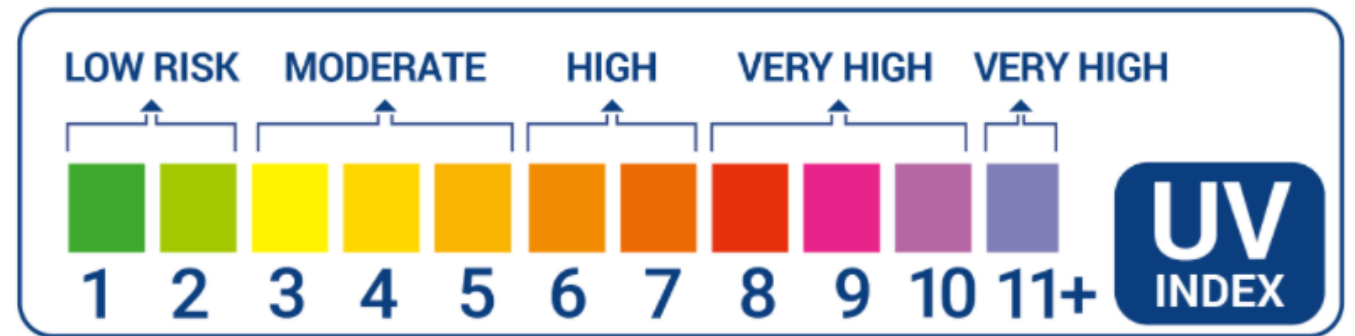


# Overview of Ultraviolet Radiation



# Ultraviolet (UV) Radiation

- What is UV radiation?
  - Radiation released by the sun or from non-natural sources (tanning beds)
- The **UV index** measures the strength of UV radiation at a given time
- The higher the UV index, the faster the skin and eye damage occurs
- Long term UV exposure damages the skin
  - Increases risk of skin cancer
  - Ages skin prematurely



# Two main types of UV light - UVA and UVB

## • UVA

- Level is constant throughout day
- Causes skin aging
  - Wrinkles
  - Loss of elasticity in skin
- **Increases skin cancer risk**
- Penetrates skin more deeply
- Passes through car windows
- Emitted by tanning beds

## • UVB

- Level peaks between 10 AM – 4 PM
- Causes sunburns
- **Increases skin cancer risk**
- Harms the top layers of skin
- Blocked by car windows

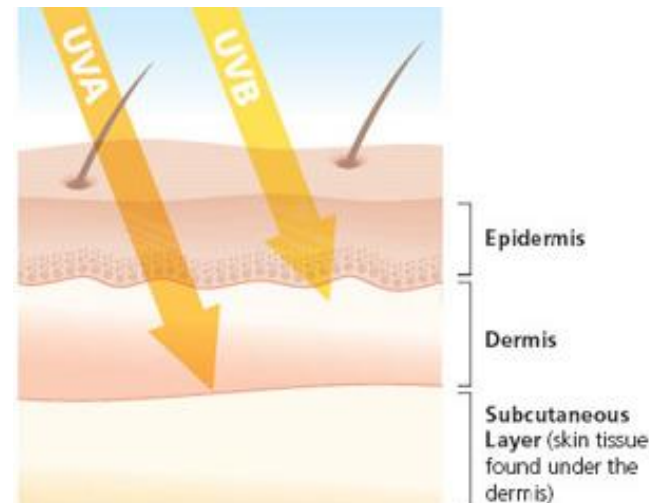


Image shows how UVB rays penetrate the top layer (epidermis) and UVA reaches a deeper layer (dermis) of the skin.

# Be aware of UVC light as well

- With the COVID19 outbreak, more people have been using germicidal UVC lamps to disinfect surfaces in their home.
- However, UVC lamps may pose **potential health and safety risks** if the unit is not installed properly or is used by untrained individuals.
- Direct exposure of skin and eyes to UVC light may cause **painful eye injury** and **burn-like skin reactions**.
- **NEVER look directly at a UVC lamp source and DO NOT use UVC lamps to sterilize your hands!**



Source: FDA: <https://www.fda.gov/medical-devices/coronavirus-covid-19-and-medical-devices/uv-lights-and-lamps-ultraviolet-c-radiation-disinfection-and-coronavirus>

# Sunburn and Cancer Risk

*A sunburn is a sure sign that skin cells have been damaged by too much UV radiation.*

***Melanoma** is a cancer affecting the skin cells (melanocytes) that give skin its darker color.*

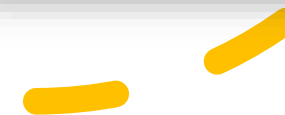
*It is a type of skin cancer that can spread.*

- One blistering sunburn in childhood  
2 times the risk of melanoma later in life
- 5 or more blistering sunburns at any age  
2 times the risk of melanoma
- Repeated painful sunburns every 2 years  
3 times the risk of melanoma

# Signs of Sun Damage



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# Age Spots (Solar Lentigines)



- Also known as liver spots or sunspots
- Sharply defined tan/brown flat color change
- Common on face, arms, and hands
- Appear or get darker with age
- Identifies people at higher risk of developing skin cancers
- Can be confused for melanoma so have your doctor evaluate the spot
- If the surface, texture, or color of the spot changes, tell your doctor

# Solar purpura

- Sun damage weakens blood vessels in the skin
- Easy bruising
- Common on tops of hands and arms
- Common in older adults
- Worse with drugs or supplements that cause bruising:
  - Blood thinners such as aspirin or non-steroidal anti-inflammatory drugs such as ibuprofen, naproxen
  - Corticosteroids (steroids are anti-inflammatory medicines)
  - Vitamin E
  - Fish oil



# Facial Wrinkles

- A disorder that occurs due to sun exposure
- UV light breaks down connective tissue, specifically collagen and elastin fibers
- Skin loses the ability to stretch and snap back to original shape (loses elasticity)
- Thickened skin and furrows develop
- Skin appears yellow
- Worse with tobacco use



# Neck Wrinkles

- **Thickened, leathery, with furrows in a geometric pattern** (Cutis rhomboidalis nuchae)
- Skin of the back of the neck
- Ends abruptly at the collar line
- Result of chronic sun exposure
- Damaged collagen and elastic tissue
- Higher risk for developing skin cancer



# Poikiloderma (poi·kilo·der·ma)

- Alternating red/brown/white discoloration in net-like pattern
- Common on the neck and upper chest in areas often exposed to the sun



# Photosensitivity

## Caused by:

- Antibiotics
- Antihistamines
- Cholesterol lowering drugs - Statins
- Non-steroidal anti-inflammatory drugs (ibuprofen, naproxen)
- Oral contraceptives and estrogens
- Antifungals
- Diuretics



## Reactions can be moderate to severe, similar to sunburn

- Allergic reaction – skin inflammation in sun-exposed areas
- Skin irritation; stinging and burning sensation, rash, blisters, itching

### Sources:

- 1.US Food and Drug Administration
- 2.Cunha JP, Stoppler MC Sun-Sensitive Drugs (Photosensitivity to Drugs) [https://www.medicinenet.com/sun-sensitive\\_drugs\\_photosensitivity\\_to\\_drugs/article.htm](https://www.medicinenet.com/sun-sensitive_drugs_photosensitivity_to_drugs/article.htm)



# Common Skin Cancers

- Basal cell carcinoma
- Squamous cell carcinoma
- Melanoma



# Risk factors for skin cancers

- Chronic UV exposure
  - Example: working outside 6+ hours in mid-day sun, leisure and sports activities, gardening, fishing and water sports, tanning beds
- Fair skin, freckles, light-colored eyes, red or light hair
- 50+ moles, large moles, moles that are unusual or atypical
- Personal or family history of skin cancer
- Weakened immune system
  - Example: organ transplant patients



# Medications that increase skin cancer risk

- Hydrochlorothiazide (a diuretic or water pill)
  - Blood pressure medication
  - Increases risk of developing squamous cell carcinoma and basal cell carcinoma
- Furosemide (a diuretic or water pill)
  - Used for heart failure, swollen legs
  - Increases sensitivity to the sun
- Azathioprine
  - Used to prevent transplant rejection for people that have received transplanted organs
  - Used for inflammatory bowel disease
  - Increases risk of developing squamous cell carcinoma and basal cell carcinoma

# Basal cell carcinoma

- Most common skin cancer
- Arises from the top layer of the skin (epidermis)
- UV damage results in uncontrolled growth of cancer cells
- Rarely spreads (metastasizes) to lymph nodes or other organs



# Basal cell carcinoma

- Common presentations:
  - Pearly white or pink bump with shiny surface that looks like you can see through it
  - Pink bump with an open sore in the center
  - Flat, reddish area
  - Brown, black or blue lesion or dark spot with raised, transparent border
  - Scar-like area that is waxy in texture
- Slow growing
  - Easily treated if detected early



Images: Skin Cancer Foundation Image Gallery

# Squamous cell carcinoma

- 2nd most common skin cancer
- Occurs in the top layer of skin (epidermis)
- Most common in older white men
- Metastasis or spread is rare, particularly for:
  - Larger lesions
  - Recurrent lesions
  - The surface of the lip (mucosa)



# Squamous cell carcinoma

- Specific risk factors:
  - Compromised immune system (e.g., organ transplant recipients)
  - Certain types of HPV (human papillomavirus) infection
- Common presentations:
  - Flat sore with scaly crust
  - Firm, red area or nodule
  - An open sore that does not heal
  - Thick elevated growth with thick adherent scale (hyperkeratosis)
  - Lips - rough scaly patch that turns into an open sore
  - Inside the mouth – red sore or rough patch



Photo provided by Dr. Richard P. Usatine, usatinemed.com  
Images: Skin Cancer Foundation Image Gallery



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Images: Mayo Clinic Gallery

# Melanoma

- Cancer of pigment cells in the skin
- If recognized and treated when confined to the top layer of the skin or before it has spread, the cure rate is high, about 100%
- If unrecognized and untreated – melanoma can spread or metastasize to other organs and lead to death
- Most dangerous form of skin cancer



# Melanoma

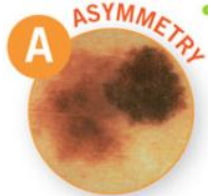
- Presentations:
  - Asymmetric dark brown/black flat area, may be elevated
  - Occasionally starts as a dark bump
  - In light skin, commonly appears on sun-exposed areas
  - In dark skin, commonly appears on the palms and soles
  - May involve a fingernail or toenail
  - Can appear on any skin surface!



Image: American Society for Dermatologic Surgery



# ABCDEs (warning signs) of Melanoma



## A Asymmetry

Two halves of a spot (mole or birthmark) do not match



## B Border

Edges are uneven, irregular, blurred, or scalloped



## C Color

Multiple shades of brown/black or a combination of red, white, and blue



## D Diameter

Larger than the size of a pencil eraser

D can also stand for "dark" - a lesion so dark that it is difficult to evaluate



## E Evolving

Change in size, shape, or color of a particular spot, mole or skin lesion





# Preventing Skin Damage

- **Do self-check skin exams**
- **Limit your exposure to the sun**
- **Protect your skin from the sun's UV rays**



# Self-check skin exams

1. Examine body front and back in a mirror
2. Bend elbows to look at forearms, upper arms, underarms, and palms
3. Check feet, including between the toes, soles of feet, and nails
4. Use hand-held mirror to check scalp, back of neck, behind the ears
5. Use hand-held mirror to check back, buttocks, and groin



# Avoid the sun

- **Avoid sun tanning**
  - Increases risk of skin cancer
  - Speeds up visible signs of aging
  - Tanning beds also speed aging and increase skin cancer risk!
- **Cover up!**
  - Wear sun protective clothing and wide-brimmed hats to provide a physical barrier from UV rays

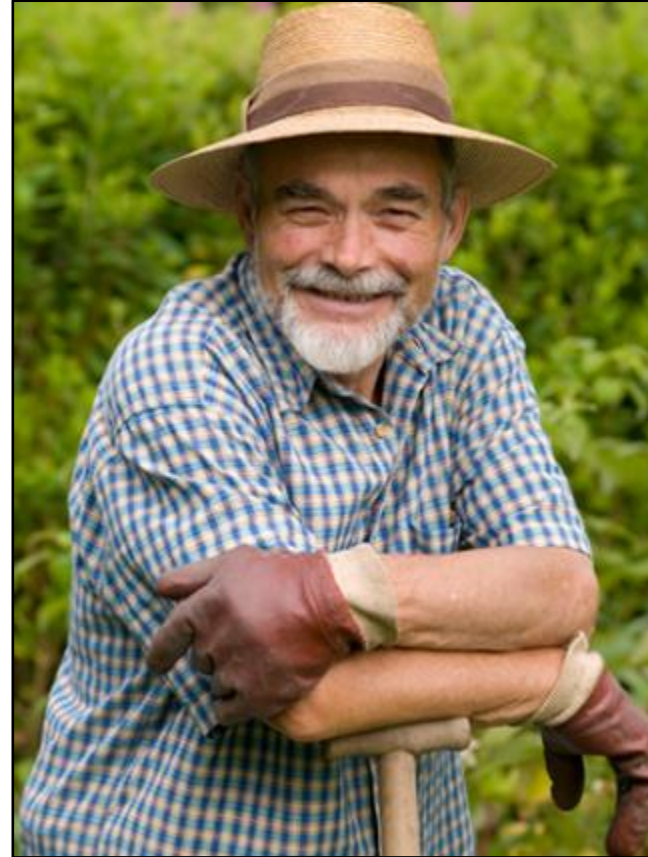


Image: Centers for Disease Control and Prevention

# Avoid the sun – wear protective clothing

- **Ultraviolet Protection Factor (UPF) Clothing**
  - **Construction** – Choose clothing that is made from tightly woven fabrics, e.g., polyester
  - **Color** – Wear dark clothing instead of white
  - **Fiber type** – Choose synthetic fibers, e.g., polyester and nylon. Natural fibers like cotton, silk and wool have a lower degree of UV protection
- **UPF measures amount of UVA and UVB rays that pass through fabric**
  - **15-24** good protection
  - **25-39** very good protection
  - **40+** excellent protection
    - UPF 25 – 4% of UV rays pass through fabric
    - UPF 50 – 2% of UV rays pass through fabric

# Avoid the Sun

- Seek shade between peak sun hours of 10 AM – 4 PM
- Be careful - UV rays bounce off sand, concrete, snow, and water
- Car windows block UVB rays, but not UVA
  - Window film can be applied to block UVA rays
    - Example: Llumar™ window film
    - Some newer cars may offer this option
    - Check the car window tinting rules and regulations from your state



# Sun Protection

- Sunscreen
- Supplements



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# Sunscreen

- **Sun Protection Factor (SPF)**
  - Rates protection against **UVB rays** (not UVA)
  - SPF number corresponds to the percentage of UVB rays blocked from penetrating the skin
  - Higher numbers mean it takes a longer time to burn your skin
- **PA+ Sunscreen rating system**
  - Ranks protection from **UVA rays**
  - The more pluses / + the more protection
  - **PA+** mild protection
  - **PA++** moderate protection
  - **PA+++** strong protection
  - **PA++++** maximum protection



# Sunscreen

- **Broad spectrum protection**

- Protects against UVA (aging rays) and UVB (burning rays)
- All sunscreens made in the U.S. are designed to block UVB
- Ingredients that also protect against UVA:
  - Zinc oxide
  - Titanium dioxide
  - Avobenzone
  - Some sunscreens manufactured in other countries include ingredients pending U.S. Food and Drug Administration (FDA) approval





# Sunscreen

- Apply liberally!
  - 2-3 tablespoons for sun-exposed skin areas
  - Apply 20-30 minutes before sun exposure
  - Reapply every 2 hours
    - Reapply right after swimming or if sweating
  - Use waterproof or water-resistant products
    - If swimming or sweating

# Supplements that are helpful

- *Polypodium leucotomos* (a species of fern) extract
  - Reduces redness with sun exposure
  - Reduces UV damage from sun exposure
  - Available at drugstores
- Vitamin B3 (Nicotinamide)
  - Take 500 mg twice daily
    - Reduces risk of basal cell carcinoma by 20%
    - Reduces risk of squamous cell carcinoma by 30%



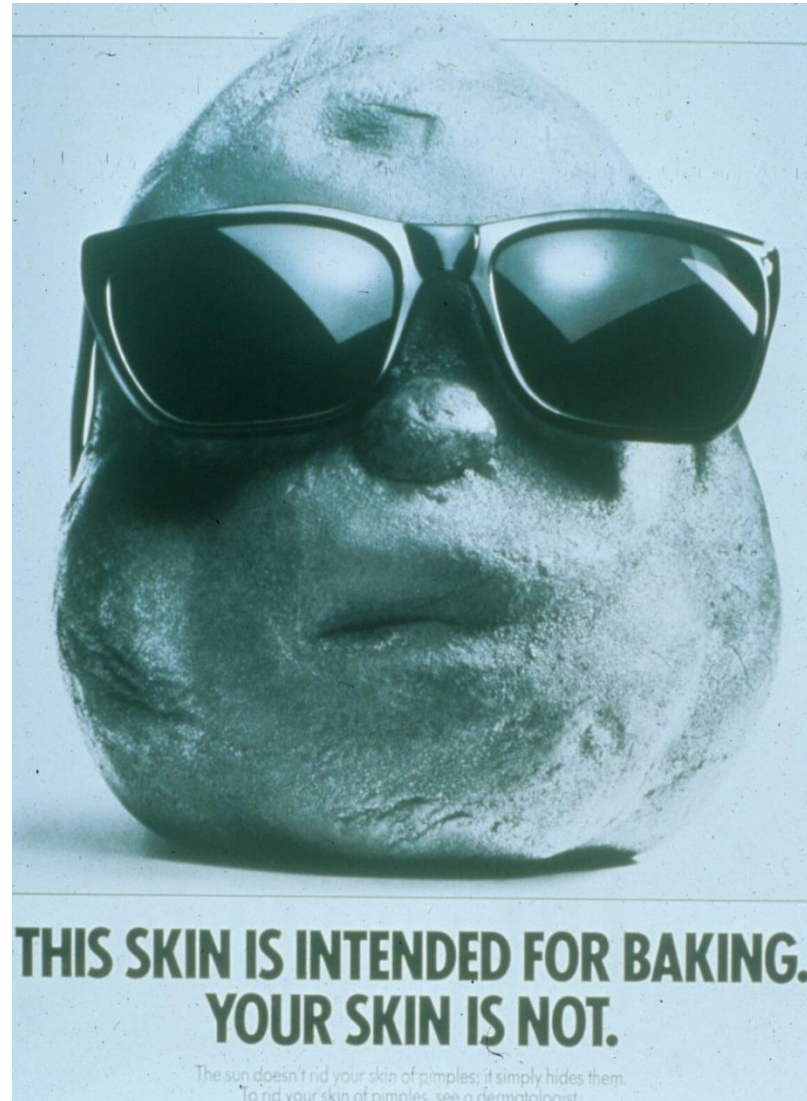
## Sources:

1. Zattra et al. *Polypodium leucotomos* Extract Decreases UV-Induced Cox-2 Expression and Inflammation, Enhances DNA Repair, and Decreases Mutagenesis in Hairless Mice. American Journal of Pathology
2. Chen, A et al. A Phase 3 Randomized Trial of Nicotinamide for Skin-Cancer Chemoprevention. N Engl J Med 2015; 373:1618-1626



# Protect Your Skin!

- Avoid the sun 10:00 AM-4:00 PM
- Seek shade
- Wear protective clothes and wide-brimmed hats
- Apply broad spectrum sunscreen with SPF 30 or higher 20-30 minutes before sun exposure
- Protect your eyes with sunglasses





[augusta.edu/cancer/community](http://augusta.edu/cancer/community)

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