

SAFETY TALK

NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM-UPPER GREAT PLAINS TRANSPORTATION INSTITUTE-NDSU

By STEVE CHASE-CIRCUIT RIDER

UV Radiation

Overview

Ultraviolet (UV) rays are a part of sunlight that is an invisible form of radiation. UV rays can penetrate and change the structure of skin cells. There are three types of UV rays: ultraviolet A (UVA), ultraviolet B (UVB), and ultraviolet C (UVC). UVA is the most abundant source of solar radiation at the earth's surface and penetrates beyond the top layer of human skin. Scientists believe that UVA radiation can cause damage to connective tissue and increase a person's risk for developing skin cancer. UVB rays penetrate less deeply into skin, but can still cause some forms of skin cancer. Natural UVC rays do not pose a risk to workers because they are absorbed by the Earth's atmosphere.

Sunlight exposure is highest during the summer and between 10:00 a.m. and 4:00 p.m. Working outdoors during these times increases the chances of getting sunburned. Snow and light-colored sand reflect UV light and increase the risk of sunburn. At work sites with these conditions, UV rays may reach workers' exposed skin from both above and below. Workers are at risk of UV radiation even on cloudy days. Many drugs increase sensitivity to sunlight and the risk of getting sunburn. Some common ones include thiazides, diuretics, tetracycline, doxycycline, sulfa antibiotics, and non-steroidal anti-inflammatory drugs, such as ibuprofen.

Workers at increased risk of UV damage include lifeguards, construction workers, agricultural workers, landscapers, gardeners, and other outdoor workers.

Sunburn

Sunburn is an often painful sign of skin damage from spending too much time outdoors without wearing a protective sunscreen. Years of overexposure to the sun lead to premature wrinkling, aging of the skin, age spots, and an increased risk of skin cancer. In addition to the skin, eyes can get burned from sun exposure. Sunburned eyes become red, dry, and painful, and feel gritty. Chronic exposure of eyes to sunlight may cause pterygium (tissue growth that leads to blindness), cataracts, and perhaps macular degeneration, a leading cause of blindness.

Symptoms

Unlike a thermal burn, sunburn is not immediately apparent. Symptoms usually start about 4 hours after sun exposure, worsen in 24-36 hours, and resolve in 3-5 days.

Symptoms may include:

- Red, warm, and tender skin
- Swollen skin
- Blistering
- Headache
- Fever
- Nausea
- Fatigue

The pain from sunburn is worse 6-48 hours after sun exposure. Skin peeling usually begins 3-8 days after exposure.

First Aid

There is no quick cure for minor sunburn:

- Symptoms can be treated with aspirin, acetaminophen, or ibuprofen to relieve pain and headache and reduce fever.
- Drinking plenty of water helps to replace fluid losses.
- Cool baths or the gentle application of cool wet clothes on the burned area may also provide some comfort.
- Workers with sunburns should avoid further exposure until the burn has resolved.
- Additional symptomatic relief may be achieved through the application of a topical moisturizing cream, aloe, or 1% hydrocortisone cream.
- A low-dose (0.5%-1%) hydrocortisone cream, which is sold over the counter, may be helpful in reducing the burning sensation and swelling and speeding up healing.

If blistering occurs:

- Lightly bandage or cover the area with gauze to prevent infection.
- The blisters should not be broken, as this will slow the healing process and increase the risk of infection.
- When the blisters break and the skin peel, dried fragments may be removed and an antiseptic ointment or hydrocortisone cream may be applied.
- Seek medical attention if any of the following occur:
 - Severe sunburns covering more than 15% of the body
 - Dehydration
 - High fever (>101°F)
 - Extreme pain that persists for longer than 48 hours

Skin Cancer

Skin Cancer Types

Basal Cell

- A small raised bump that looks smooth, shiny, and translucent.
- A small, pink, crater-like growth with a raised, rolled border and an indentation in the center.
- A scar-like area that is white, yellow, or waxy.
- Reddish, irritated patches of skin.
- A sore that does not heal.
- Can usually be removed by excision or topical treatments.
- If diagnosed and treated early, basal cell cancers can be cured.

Squamous Cell

- Crusty, warty appearance.
- A raised growth with a depression in the center.
- Scaly, red patch area.
- A sore that does not heal.
- Can usually be removed by excision or topical treatments.
- If diagnosed and treated early, squamous cell cancers can be cured.

Melanoma

Changes in the size, shape, or color of moles.

- Dark mole-like appearance.
- Flat or slightly elevated discolored patch (tan, brown, red, black, blue, or white).
- Change on the skin:
- New spot developing.
- Change in size, color, or shape of existing spot or mole.
- Malignant melanoma carries significant, even fatal implications.
- Incidence of melanoma has been steadily rising, affecting people of all ages.

Symptoms



In particular, watch for:

- Irregular borders on moles (ragged, notched, or blurred edges).
- Moles that are not symmetrical (one half doesn't match the other).
- Colors that are not uniform throughout.
- Moles that are bigger than a pencil eraser.
- Sores that bleed and do not heal.
- Itchy or painful moles.
- Red patches or lumps.
- New moles.

Recommendations for Employers

Employers should take the following steps to protect workers from exposure to UV radiation:

- When possible, avoid scheduling outdoor work when sunlight exposure is the greatest
- Provide shaded or indoor break areas
- Provide training to workers about UV radiation including:
 - Their risk of exposure
 - How to prevent exposure
 - The signs and symptoms of overexposure

Recommendations for Workers

Workers should follow these recommendations to protect themselves from UV damage:

- Wear sunscreen with a minimum of SPF 15.
 - SPF refers to the amount of time that persons will be protected from a burn. An SPF of 15 will allow a person to stay out in the sun 15 times longer than they normally would be able to stay without burning. The SPF rating applies to skin reddening and protection against UVB exposure.
 - SPF does not refer to protection against UVA. Products containing Mexoryl, Parsol 1789, titanium dioxide, zinc oxide, or avobenzone block UVA rays.
 - Sunscreen performance is affected by wind, humidity, perspiration, and proper application.
- Old sunscreens should be thrown away because they lose their potency after 1-2 years.

- Sunscreens should be liberally applied (a minimum of 1 ounce) at least 20 minutes before sun exposure.
 - Special attention should be given to covering the ears, scalp, lips, neck, tops of feet, and backs of hands.
- Sunscreens should be reapplied at least every 2 hours and each time a person gets out of the water or perspires heavily.
 - Some sunscreens may also lose efficacy when applied with insect repellents, necessitating more frequent application when the two products are used together.
- Follow the application directions on the sunscreen bottle.
- Another effective way to prevent sunburn is by wearing appropriate clothing.
 - Dark clothing with a tight weave is more protective than light-colored, loosely woven clothing.
 - High-SPF clothing has been developed to provide more protection for those with photosensitive skin or a history of skin cancer.
- Workers should also wear wide-brimmed hats and sunglasses with almost 100% UV protection and with side panels to prevent excessive sun exposure to the eyes.

Content Source: National Institute for Occupational Safety and Health (NIOSH)