

The Quick-Spreading, Deadly Skin Cancer: Malignant Melanoma

With summer approaching in the Northern Hemisphere, this is a good opportunity to look at skin cancer in general and melanoma in particular. Although there may be a genetic predisposition for certain skin cancers, melanoma primarily results from repeated exposure to sunshine over many years.

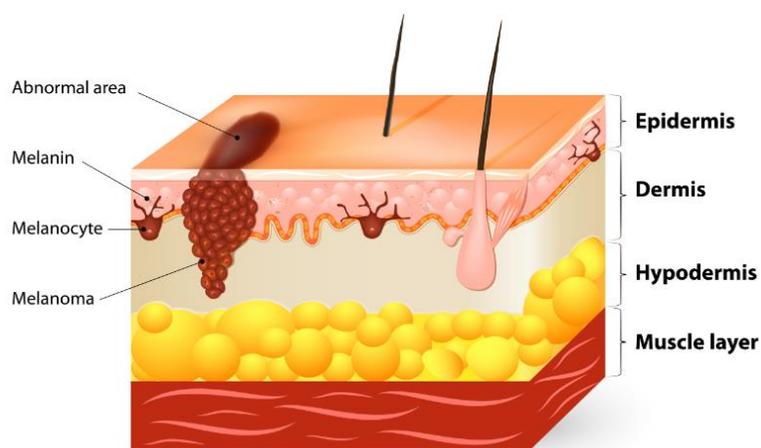
Anatomy of the skin

The skin is the body's barrier to the outside world. It is divided into an outer layer, or epidermis, a middle layer called the dermis, and a basal layer called the hypodermis.

The skin continually renews itself and is composed of numerous layers of cells containing sweat and sebaceous glands that produce oil, hair follicles, blood vessels, and nerve receptors.

Certain cells in the lower part of the epidermis, called melanocytes, produce melanin, the pigment that gives the skin its color. Exposure to sunlight increases melanin production, resulting in darkening of the skin. Clustering of pigmented melanocytes produces darker areas on the skin, ranging from small freckles to larger moles.

However, melanocytes are also responsible for one of the most quick-spreading, and thus deadliest, skin cancers—malignant melanoma.



The effects of ultraviolet radiation on the skin

The sun produces ultraviolet (UV) radiation (UVA and UVB rays), which travels through space. Although much of the ultraviolet radiation that reaches the Earth's atmosphere has been filtered out, huge quantities of UVA and UVB radiation still reach the Earth's surface.

Melanin, produced by melanocytes, acts to protect the skin against the sun's UV radiation, but too much sunshine is dangerous for the skin.

Ultraviolet radiation penetrates the skin to attack not just the skin cells but also the genetic material (DNA) contained in the skin cells. Repeated damage of the skin cells over the years accelerates aging of the skin, as well as dryness and wrinkling, and increases the risk of skin cancer, particularly malignant melanoma.



Skin cancer

Skin cancer is usually easy to detect by just self-examining the skin. The three forms of skin cancer are

- **Basal cell carcinoma** represents 80% of all skin cancers and occurs mostly after the age of 40. It is rarely fatal.
- **Squamous cell carcinoma** represents 10% of all skin cancers and is quite rare before the age of 50. Frequently occurring on the hands and face, it can spread throughout the body and become fatal.
- **Melanoma** is typically called **malignant melanoma** because although it represents only 10% of all skin cancers it is highly malignant, which means that it easily spreads (metastasizes) to other parts of the body.

Malignant melanoma

Malignant melanoma is the most dangerous form of skin cancer. It is caused by the uncontrolled growth of the melanocytes present in the skin under the effect of repeated and excessive exposure to sunshine. Untreated, malignant melanoma rapidly invades the skin and spreads to the rest of the body, metastasizing to the brain, lungs, lymph nodes, and bones to result in death within a matter of months.

Although very common in men and women between the ages of 20 to 40, malignant melanoma is also diagnosed to a lesser degree in children and adolescents. The good news is that it is one of the easiest cancers to detect and prevent.



The risk of developing melanoma is much lower in dark-skinned people. Fair-skinned, blue-eyed, or red-headed men and women living in sunny climates are at the most at risk for melanoma and other superficial skin cancers. The occurrence of skin cancers in general is about 15 times more frequent in fair-skinned people than in dark-skinned people. Australia and New Zealand have the highest rates of melanoma in the world, primarily because of higher UV exposure resulting from the Earth's elliptical orbit of the sun.

Although melanoma is found most often in the upper back and torso of men and on the legs of women, it can appear anywhere on the body, including the eyes, which is called ocular melanoma and is the most common type of cancer in the eye.

Worldwide, there are approximately 230,000 new melanoma cases per year resulting in 50,000 deaths per year.

Moles and malignant melanoma

Most melanomas originate from a benign-looking mole, or nevi. Everyone has moles on the surface of their skin. These small, dark, benign skin lesions may contain clustered pigmented melanocyte cells. A greater density of pigment produced by melanocytes will produce a small freckle.

While some people have less than 10 moles on their skin, others may have up to a hundred. Moles may be flat or raised, smooth or wrinkled, with hair or not. They vary in color and shape. Some are present at birth, others may appear later in life.

Although the vast majority of moles will never require medical treatment, moles that change in appearance must be examined by a doctor. Thousands of these formerly benign-looking skin lesions are diagnosed as malignant melanoma each year.

Unfortunately, many patients consult their doctor when the cancer has attacked deeper parts of the skin. If not treated early and aggressively, the cancerous melanoma cells continue to grow deeper into the skin and then spread to the rest of the body, where they are rapidly fatal.

The thicker the melanoma the poorer the prognosis. The cure rate is almost 100% for a melanoma that measures less than 0.75 millimeters (0.03 inches) in thickness. The cure rate drops significantly to less than 50% over a 5-year period when the melanoma measures 3 millimeters (0.12 inches) or more in thickness.

How to detect suspicious moles

Moles can be present at birth or appear mainly during childhood or early adulthood. They are usually brown or tan, flat or slightly raised, round to oval in shape.

Moles are on the surface of the skin and visible to everyone who wants to take the time to look at his or her skin. What to watch for is a mole that changes in appearance—meaning that it may be evolving toward skin cancer in a matter of months or years. When in doubt the safest thing to do is to see a dermatologist and have the mole evaluated and removed as necessary.

To help you differentiate between an ordinary, benign mole and one that is abnormal, the American Cancer Society has devised the simple A-B-C-D-E rule. If the appearance of a mole has changed recently and has any of the characteristics below, medical attention should be sought as quickly as possible.



Benign mole



Malignant melanoma

A = Asymmetry of the mole. The two previously symmetrical halves of the mole no longer match.

B = Border. The edges of the mole have become irregular, ragged, or blurred.

C = Color. The mole has recently changed colors. Various shades and colors of brown, tan, black, and sometimes even red or blue can be observed.

D = Diameter. The mole has recently increased in diameter. Any mole that is more than 0.64 cm (a quarter of an inch) should be examined by a skin specialist

E = Elevation. The mole was initially flat and has become either sunken or raised.

Check your skin, especially areas with frequent sun exposure, preferably every month. Use a mirror or ask someone to look at areas you cannot easily see. Most melanomas can be found early, while still treatable, with self-skin exams.

Treating suspicious growths and melanomas

Any mole or nevus that changes color, shape, size, or thickness or that becomes itchy, scaly, or tender or starts to bleed should be examined by a dermatologist. Diagnosis is not always easy. The doctor will examine the suspicious mole and may recommend its removal under local anesthesia. The removed piece of skin or biopsy will be sent to a pathologist to check for cancerous melanoma cells.

If there are no cancerous cells, no further treatment is necessary. If however, cancerous melanoma cells are found, a small additional area of normal skin around the initial site of the melanoma must be removed to ensure that no melanoma cells remain. In some cases, a skin graft may be necessary to restore the excision site.

If treatment begins at a later developmental stage, unfortunately the melanoma has often spread (metastasized) to other parts of the body, such as the lungs, liver, and brain. Surgery alone may not be sufficient, and the addition of chemotherapy, radiation therapy, or immunotherapy may be recommended. Treatment at this stage of the disease may not be sufficient to stop its evolution.

Preventing melanomas

The skin essentially acts as an **ultraviolet meter**. From your day of birth, the skin measures UV exposure and records exactly how much ultraviolet light you have been exposed to. As with the electric meter at home, you cannot dial back the reading. Each additional exposure to sunshine increases the reading on the skin's UV meter.



If you cannot go back, you can prevent going forward. Therefore:

- Avoid excessive and repeated exposure to the sun.
- Do not spend hours in the sun, even if it is cloudy or windy.
- Avoid sun exposure or particularly sunbathing, particularly during the peak midday hours (11 a.m. to 3 p.m.).
- Remember that exposure to the sun's rays increases with altitude.
- Wear a long-sleeve shirt and long pants when in the sunshine.
- Wear a wide-brimmed hat and sunglasses.
- Use sunscreen with a high protective level (sun protection factor [SPF] > 30) and repeat the application every 2 hours, especially if you are sweating or engaging in water sports.
- If swimming, use water-resistant sunscreen and repeat the application when you leave the water.

Contrary to popular belief, the suntan that results from the melanocyte cells producing skin-darkening melanin does not protect the skin. It is only a visible sign that the skin has been injured by too much exposure to UV radiation and that skin damage is occurring.

Conclusion

Malignant melanomas are most common in fair-skinned men and women before the age of 40. They are mole-like skin lesions that are easy to treat if detected at an early stage. Any mole that changes its color, shape, size, or elevation or becomes itchy, scaly, or bleeding should be examined by a skin specialist (dermatologist). If a malignant melanoma is surgically removed at an early stage the cure rate equals 100%.

But the best approach is to not let melanomas form in the first place. Remember that excessive exposure to the sun's UV radiation is the one most important preventable cause of melanomas.