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Melanoma - Diagnosis [1]

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ON THIS PAGE: You will find a list of the common tests, procedures, and scans that doctors can use to find out whether a suspicious mole or other skin growth is cancerous. To see other pages, use the menu on the side of your screen.

Doctors use many tests to diagnose cancer and find out if it has spread to another part of the body, called metastasis. For melanoma, a biopsy of the suspicious skin area, called a lesion, is the only way to make a definitive diagnosis. The doctor may suggest other tests that will help make a diagnosis and determine the overall stage of the melanoma. Imaging tests may be used to find out whether the cancer has spread.

This list describes options for diagnosing melanoma, but not all of the tests listed will be used for every person.

Biopsy and pathologic examination of a skin lesion

Other tests can suggest that cancer is present, but only a biopsy can make a definite diagnosis. Before a biopsy, a health care provider will usually numb the area with a local anesthetic. Then he or she will remove the suspicious skin growth, making sure to preserve the entire lesion so the thickness of the potential cancer and its margin (healthy tissue around the lesion) can be carefully examined.

A pathologist then analyzes the sample(s) removed during the biopsy to figure out if the lesion is a melanoma. A pathologist is a doctor who specializes in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease.

The pathologist will write a report, called a [pathology report](#) [3], that should include at least the

following information:

- Type/subtype of melanoma
- Thickness of melanoma
- Presence or absence of ulceration
- How rapidly the cells are dividing, which is called the mitotic rate
- Presence of immune cells called tumor infiltrating lymphocytes
- Margin status, which describes whether melanoma cells can be seen at the edges of the biopsy specimen

Each of these items is described in detail below.

Types of melanoma of the skin

There are four types of skin or cutaneous melanoma:

- **Superficial spreading melanoma.** This is the most common type, accounting for 70% of melanomas. It usually develops from an existing mole.
- **Lentigo maligna melanoma.** This type tends to occur in older people. It most commonly begins on the face, ears, and arms on skin that is chronically exposed to the sun.
- **Nodular melanoma.** This type accounts for about 15% of melanomas, and it often appears rapidly as a bump on skin. It is usually black, but it may be pink or red.
- **Acral lentiginous melanoma.** This type of melanoma develops on the palms of the hands, soles of the feet, or under the nail bed. It sometimes occurs on people with darker skin. Acral lentiginous melanoma is not related to sun exposure.

Subtypes of melanoma

Recent information has shown that melanoma can also be classified into molecular (genetic) subtypes based on the melanoma cells' distinct genetic changes rather than histologic types, which are based on how melanoma cells appears under a microscope. These genetic changes include:

- ***BRAF* mutations.** The most common genetic change in melanoma is found in the *BRAF* gene, which is mutated in about 50% of cutaneous melanomas.
- ***NRAS* mutations.** *NRAS* is mutated in the tumors of approximately 20% of patients with melanoma.
- ***KIT* mutations.** These mutations occur more commonly in melanomas that develop from the mucosal lining, melanomas on the hands or feet, or melanomas that occur in chronically sun damaged skin, such as lentigo maligna melanoma. *KIT* mutations may influence a patient's treatment options.

Some melanomas do not have mutations in *BRAF*, *NRAS*, or *KIT*. These tumors have other genetic changes that cause them to grow. Researchers are currently trying to target the other mutations found in these tumors in clinical trials.

The classification of melanoma into different subtypes based on genetic changes can have a major effect on treatment options, since targeting specific mutated genes is an important new way of treating invasive melanoma. Learn more about this approach, called targeted therapy, in the [Treatment Options](#) [4] and [Latest Research](#) [5] sections.

Thickness of melanoma

The thickness of melanoma is the most reliable characteristic that helps doctors predict the risk that the cancer will spread. To do this, the pathologist will measure from the top of the skin down to the underlying skin.

- **Thin.** A melanoma tumor that is less than 1 mm thick is characterized as "thin." A thin melanoma is associated with a low risk of spread to regional lymph nodes or to distant parts of the body.
- **Intermediate.** An intermediate-thickness melanoma is between 1 mm and 4 mm.

- **Thicker.** A thicker melanoma, greater than 4 mm thick, is associated with a higher chance of recurrence presumably because the cancer has already spread to other parts of the body at the time of diagnosis. Recurrence is when a cancer comes back after treatment.

Mitotic rate

Another pathologic feature of melanoma is the mitotic rate, which is an estimate of the speed at which tumor cells are dividing. It is measured as the number of mitoses per millimeter squared (mm²). In combination with the thickness and the presence of ulceration, the mitotic rate is used to help determine the stage, treatment options, and prognosis of melanoma (see below).

Ulceration

The presence or absence of ulceration of the primary melanoma is defined in the pathology report. Ulceration is the loss of the surface of the skin. If the melanoma is ulcerated, research has shown it significantly increases the risk of spread and recurrence.

Additional evaluation after a diagnosis of melanoma

After an initial diagnosis of melanoma, you will be referred to a specialist. The doctor will take a complete medical history, noting any [symptoms or signs](#) [6], and perform a complete physical examination, including a total skin examination. This could also include a sentinel lymph node biopsy (see the [Treatment Options](#) [4] section.) The focus of these examinations is to identify risk factors and signs or symptoms that may indicate melanoma has spread beyond the original site.

The extent of the initial evaluation is based on the risk of recurrence associated with the primary (original) melanoma. In general, for most low-risk melanomas, such as those less than 1 mm thick, no further search for metastases or spread is necessary. For people with higher-risk melanoma, more extensive testing, such as lymph node assessment and the other tests described below, may be considered. Therefore, the extent of the initial evaluation for a patient with newly diagnosed melanoma depends upon on the [stage](#) [7] of melanoma and discussions with the team of doctors.

Depending on the results of the evaluation, including the pathology report of the primary melanoma tumor, further testing for high-risk or later-stage melanoma may include the following:

- [Ultrasound](#) [8]. An ultrasound uses sound waves to create a picture of the internal organs, including collections of lymph nodes, called lymph node basins, and soft tissue.
- [Computed tomography \(CT or CAT\) scan](#) [9]. A CT scan creates a three-dimensional

picture of the inside of the body with an x-ray machine. A computer then combines these images into a detailed, cross-sectional view that shows any abnormalities or tumors. If melanoma has spread, a CT scan can also be used to measure the tumor's size. Sometimes, a special dye called a contrast medium is given before the scan to provide better detail on the image. This dye can be injected into a patient's vein or given as a liquid to swallow.

- [Magnetic resonance imaging \(MRI\)](#) [10]. An MRI uses magnetic fields, not x-rays, to produce detailed images of the body. MRI can also be used to measure the tumor's size. A special dye called a contrast medium is given before the scan to create a clearer picture. This dye can be injected into a patient's vein or given as a liquid to swallow.
- [Positron emission tomography \(PET\) scan](#) [11]. A PET scan is a way to create pictures of organs and tissues inside the body. A small amount of a radioactive sugar substance is injected into the patient's body. This sugar substance is taken up by cells that use the most energy. Because cancer tends to use energy actively, it absorbs more of the radioactive substance. A scanner then detects this substance to produce images of the inside of the body.

There are advantages and disadvantages to each of these tests. Depending on your situation, your doctor may feel that one is more appropriate for you than others. Your doctor may also feel you don't need any of these tests. Talk with your doctor about which test(s) will provide the most useful information about your condition.

After diagnostic tests are done, your doctor will review all of the results with you. If the diagnosis is cancer, these results also help the doctor describe the cancer; this is called staging.

The [next section in this guide is Stages](#) [7], and it explains the system doctors use to describe the extent of the disease. Or, use the menu on the side of your screen to choose another section to continue reading this guide.

Links

[1] <http://www.cancer.net/cancer-types/melanoma/diagnosis>

[2] <http://www.cancer.net/about-us>

[3] <http://www.cancer.net/node/24715>

[4] <http://www.cancer.net/node/19258>

[5] <http://www.cancer.net/node/19263>

[6] <http://www.cancer.net/node/19255>

[7] <http://www.cancer.net/node/19257>

[8] <http://www.cancer.net/node/24714>

[9] <http://www.cancer.net/node/24486>

[10] <http://www.cancer.net/node/24578>

[11] <http://www.cancer.net/node/24648>