BITO Health

MELANOMA

MELANOMA AND SURGERY

This beautifully designed magazine has been created to give you all the essential information about Melanoma in an easy-to-understand manner. We aim to empower you throughout your journey, enabling you to make informed choices, anticipate treatment and lifestyle changes, and ultimately achieve the best possible outcome.

LET'S START THE JOURNEY.
LET'S BRING IT ON!

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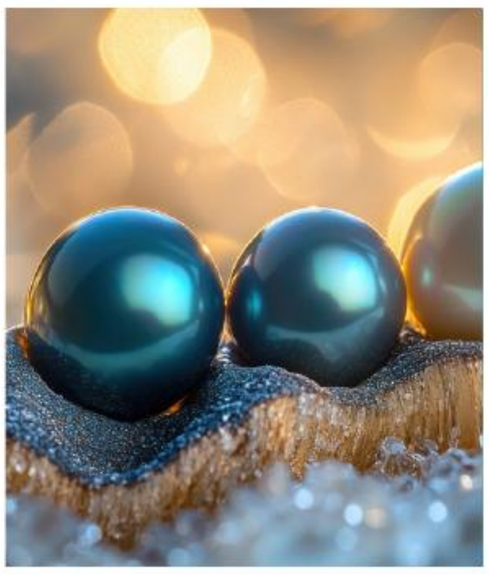


INTRODUCTION

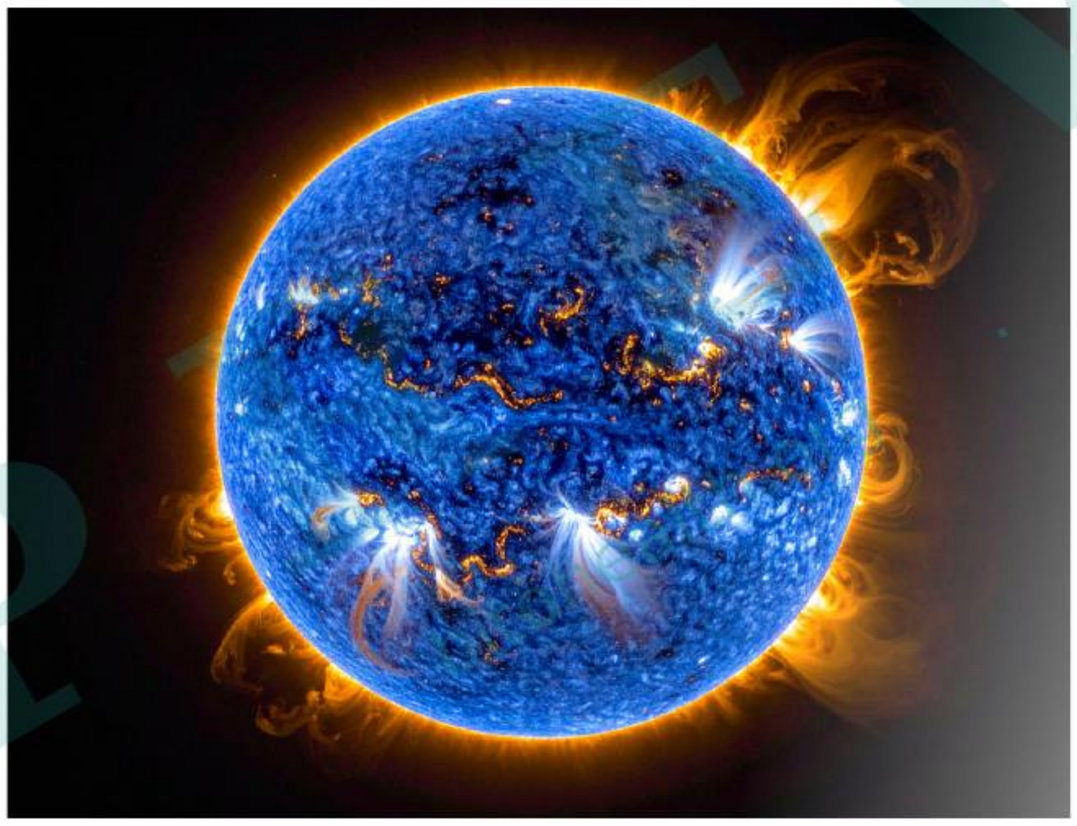
MELANOMA is the fifth most common cancer, representing approximately 1% of skin cancer cases but responsible for the majority of skin cancer deaths. In the U.S., around 104,000 new cases are diagnosed annually, with a slightly higher prevalence in men. It is more common among fair-skinned populations, especially in high UV radiation areas. For individuals aged 50 and older, the incidence has increased by approximately 3% per year for women, while rates for men have remained relatively stable.

WHAT IS MELANOMA

Melanoma is a type of skin cancer that originates in melanocytes, the cells responsible for producing melanin, which gives skin its pigment. This cancer develops when these cells undergo genetic mutations, often caused by excessive exposure to UV radiation from the sun or tanning beds. As a result, the cells begin to grow uncontrollably, which can lead to the cancer invading surrounding tissues and spreading to other parts of the body.

RISK FACTORS FOR MELANOMA

Understanding the risk factors for melanoma is crucial for prevention and early detection. The main risk factors include:



1. Environmental Factors:

a. Ultraviolet (UV) Radiation: Ultraviolet (UV) radiation-from the sun or tanning beds is the main environmental risk factor because it damages skin cell DNA.
b. Sunburns: History of severe sunburns, especially during childhood

2. Physical Factors:

a. Skin Type: Fair skin, light hair, and light eyes are more susceptible to UV damage
b. Moles: Having many moles or atypical (dysplastic) moles

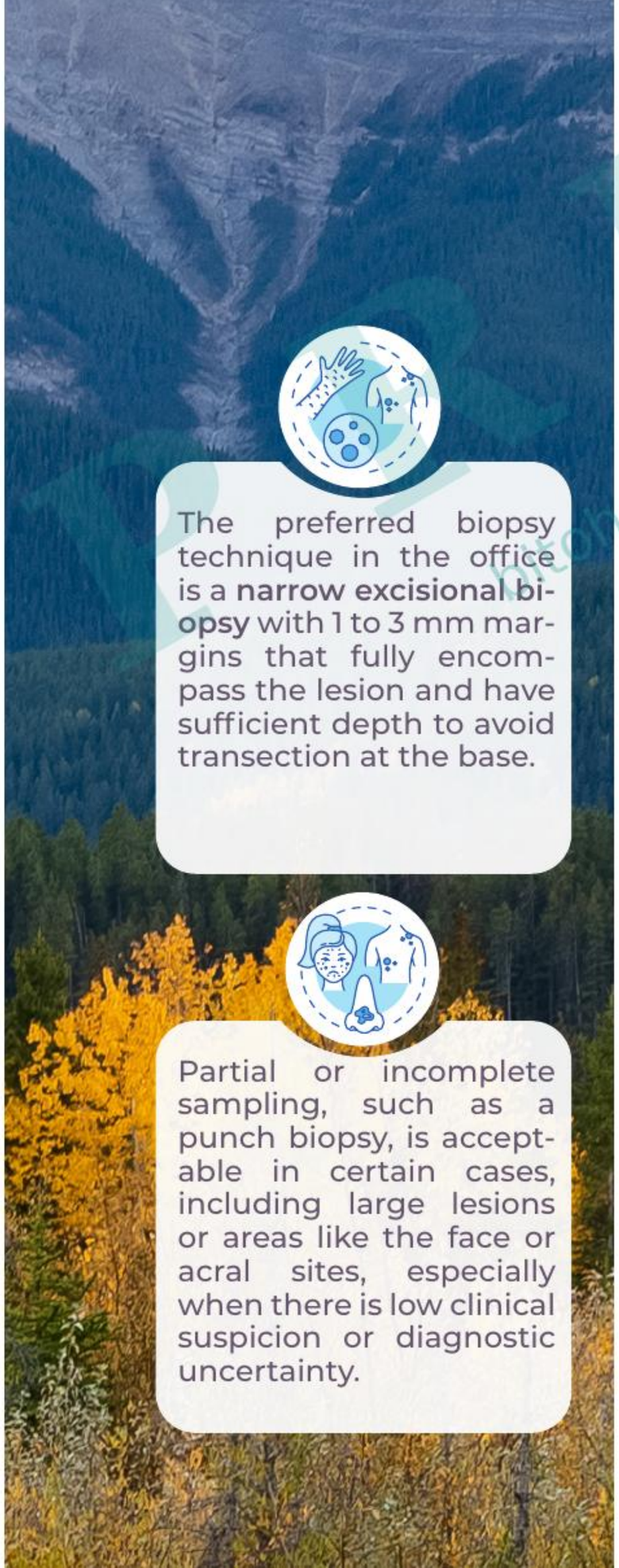
3. Personal Factors:

a. Age: The risk increases with age, although melanoma is also common in younger adults
b. Gender: Before age 50, melanoma is more common in women; after age 50, it is more common in men
c. Previous Skin Cancer: A personal history of melanoma or other skin cancers
d.Weakened Immune System: Conditions or medications that weaken the immune system
e.Family History: Having a family history of melanoma increases the risk, as it suggests a possible genetic predisposition.
f.Genetic Mutations: Certain genetic mutations, such as those in the CDKN2A gene

SCREENING RECOMMENDATIONS

The United States Preventive Services Task Force (USPSTF) has determined that there is insufficient evidence to assess the benefits and risks of clinician-performed visual skin examinations for screening skin cancer in asymptomatic adolescents and adults. As a result, the USPSTF does not recommend routine skin cancer screening for individuals who do not have symptoms. This recommendation does not apply to those with a personal or family history of skin cancer or to individuals showing symptoms, such as changes in skin lesions or irregular moles.

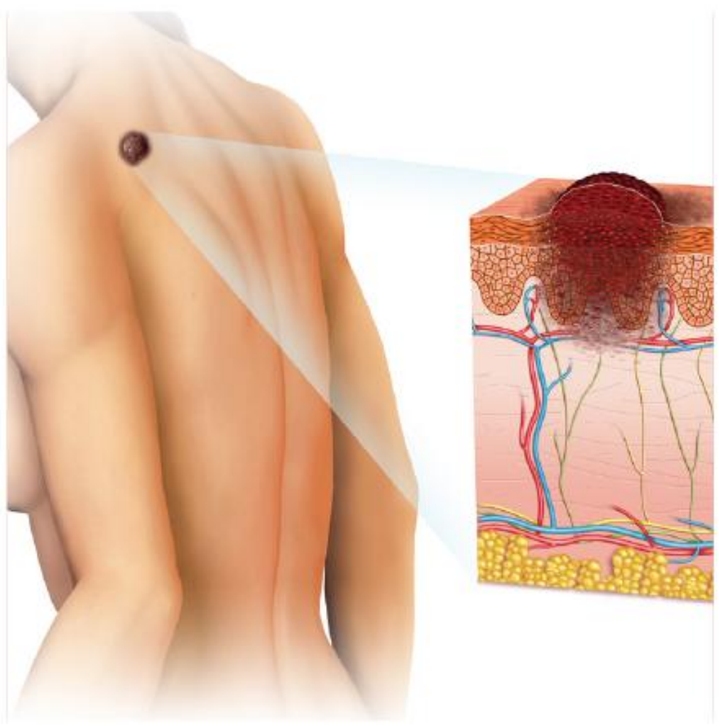
Symtoms and Signs of Melanoma



The preferred biopsy technique in the office is a **narrow excisional biopsy** with 1 to 3 mm margins that fully encompass the lesion and have sufficient depth to avoid transection at the base.

Partial or incomplete sampling, such as a punch biopsy, is acceptable in certain cases, including large lesions or areas like the face or acral sites, especially when there is low clinical suspicion or diagnostic uncertainty.

The ABCDE rule can help you identify warning signs of melanoma. Early detection is vital, so monitor your skin and consult a physician if you notice any of the following:



MOLE CHANGES:

1. **A** - Asymmetry: One half of the mole doesn't match the other.
2. **B** - Border: Edges are irregular, ragged, or blurred.
3. **C** - Color: Varies shades (brown, black, pink, red, white, or blue).
4. **D** - Diameter: Larger than 6 millimeters (about ¼ inch), though some melanomas can be smaller.
5. **E** - Evolving: Changes in size, shape, or color.

OTHER SYMPTOMS:

1. New pigmented growths
2. Non-healing sores or ulcers
3. Raised bumps or nodules
4. Scaly or rough patches
5. Itching, pain, or bleeding in moles

HIDDEN MELANOMAS:

Can occur in non-sun-exposed areas (e.g., soles of feet, palms, under nails) and rarely in internal organs (e.g., eyes, mouth, genitals)

DIAGNOSIS

"CLINICAL SUSPICIOUS LESION"

PRE-BIOPSY PHOTOGRAPHS:

Crucial for clinical and pathological correlation, helping to prevent wrong-site surgeries if additional treatment is necessary.

DERMOSCOPY (OR NEWER NONINVASIVE TECHNIQUE):

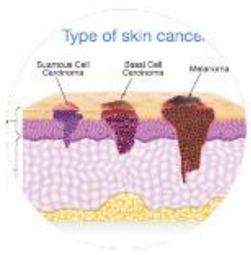
A non-invasive technique that uses a thermoscope to examine skin lesions. It enhances the visibility of skin structures not seen by the naked eye, aiding in the diagnosis of skin conditions like melanoma. This method is particularly effective in distinguishing between benign and malignant pigmented lesions,improving melanoma diagnosis accuracy.

SKIN BIOPSY

A skin biopsy can be performed partially or completely.

1. Partial Biopsies
(incisional or incomplete) may lead to inaccurate staging of cutaneous melanoma, negatively affecting treatment planning.
2. Excisional Biopsies
(complete biopsies) are preferred for suspected cutaneous melanoma, as they remove the entire lesion with clear margins and sufficient depth. A peripheral margin of 1 to 3 mm around the lesion is typically recommended. A diagnostic excisional biopsy can be performed in three ways:

(1)
elliptical
excision



(2)
punch excision
around the
lesion

(3)
deep shave or
sauceriza-tion.

PATHOLOGY REPORT

Clinical information to be provided to the pathologist: Age, gender and anatomical location, biopsy intent, size of the lesion, clinical impression or pre-biopsy photograph.

Information to be provided by the pathologist to the clinician.

1. Size of the specimen
2. Tumor thickness (Breslow), nearest 0.1 mm
3. Ulceration
4. Dermal mitotic rate: Number of mitosis/mm2
5. Peripheral and deep margin status
6. Microsatellitosis
7. Others: Angiolymphatic or lymphvascular invasion (+/-), Histologic subtype, Neurotropism or perineural invasion (+/-), regression (-/+), Tumor-infiltrating lymphocytes (+/-), Anatomic level of tumor invasion (Clark level), and etc.

CHALLENGING CASE: BENIGN VS MALIGNANT

When doctors encounter melanocytic neoplasms—growths associated with pigment-producing cells—that are difficult to classify as either benign (non-cancerous) or malignant (cancerous) based solely on microscopic examination, they may utilize additional tests to obtain a more definitive diagnosis.These tests include:

1. Immunohistochemistry (IHC): This technique employs special stains to detect specific proteins within the cells.
2. Comparative Genomic Hybridization (CGH): This method assesses changes in the number of DNA segment copies.
3. Fluorescence In Situ Hybridization (FISH): This technique uses fluorescent probes to identify specific DNA alterations.
4. Gene Expression Profiling (GEP): This test measures the activity of certain genes to determine whether they are activated or deactivated.
5. Single-Nucleotide Polymorphism (SNP) Array: This method detects small genetic variations.
6. Next-Generation Sequencing (NGS): This technique analyzes the DNA sequence to identify mutations.

MOLECULAR TESTING (IN SELECTED CASES)

In select cases, molecular testing can be vital for evaluating melanoma aggressiveness, predicting lymph node involvement, and informing treatment options, including eligibility for certain clinical trials.Key tests involve:

1. BRAF Mutation Testing: Identifies mutations in the BRAF gene, present in about 50% of melanomas, and determines eligibility for BRAF inhibitors (e.g., vemurafenib).

2. NRAS Mutation Testing: Detects mutations in the NRAS gene found in 15-20% of melanomas, guiding treatment for patients without. BRAF mutations.

3. KIT Mutation Testing: Identifies KIT gene mutations common in certain melanoma subtypes, determining eligibility for KIT inhibitors (e.g., imatinib).

4. Gene Expression Profiling (GEP): Assesses gene expression to predict metastasis and recurrence risk, aiding management in stage I and II melanomas.

5. Next-Generation Sequencing (NGS): Offers comprehensive genomic profiling to identify actionable mutations and guide targeted therapy selection cancer. Urgent referral is advised for those with abnormal vaginal bleeding, regardless of age or menopausal status.

STAGING

WHAT TESTS ARE NEEDED AFTER MELANOMA DIAGNOSIS?

After diagnosing melanoma, additional tests are conducted to determine the local extent and the stage of the tumor. This staging is crucial for planning appropriate treatment options and predicting survival chances. Various staging modalities, such as CT, MRI, and PET scans, provide information regarding the tumor's size, location, lymph node involvement, and potential distant metastasis.

BLOOD TESTS

Tests such as serum Lactate Dehydrogenase (LDH), Complete Blood Count (CBC), Basic Metabolic Panel (Chem 7), Liver Function Tests (LFTs), calcium levels, and Prothrombin Time (PT), among others, may be performed.

Lactate Dehydrogenase (LDH) plays a significant role in the management of melanoma. Although it is not very sensitive for detecting metastasis, elevated LDH levels serve as a surrogate marker for tumor burden. Higher LDH levels indicate more advanced disease and typically suggest a poorer prognosis.

CHEST X-RAY

A chest X-ray can be done quickly to provide an initial overview of the lungs, helping detect any abnormalities. If an abnormality is found, a CT scan will be recommended.

CT SCAN (COMPUTER TOMOGRAPHY)

A CT scan is an X-ray technique that produces detailed images of the chest, abdomen, and pelvis. This study is particularly valuable for patients with high-grade melanoma as it helps evaluate for metastatic disease.

PET SCAN (POSITRON EMISSION TOMOGRAPHY)

A PET scan is a nuclear medicine test that uses a radioactive tracer to measure how cells use energy. The tracer is injected into a vein and travels through the bloodstream. Cancer cells absorb more tracer than normal cells, appearing as bright spots on the PET scan. Positron emission tomography (PET) or integrated PET/CT should be used more selectively to exclude hidden regional or distant metastases in patients with operable tumors.

MULTIDISCIPLINARY TEAM APPROACH

SPECIALIST PHYSICIANS YOU WILL MEET

You will be supported by a multidisciplinary team that provides comprehensive and coordinated care throughout your melanoma treatment journey. Each team member has expertise in different aspects of treatment, which contributes to your overall care. The presence of a family member or friend can be invaluable, offering emotional support and assisting in understanding the complex information and decisions that arise during treatment. Together, the medical team and your support system will work towards achieving the best possible outcomes for you.

MEDICAL ONCOLOGIST

A medical oncologist is a specialized physician who treats cancer using chemotherapy, targeted therapy, immunotherapy, and other biological therapies. They also provide supportive care and coordinate your treatment plan with other specialists.

RADIATION ONCOLOGIST

A radiation oncologist is a specialized physician who treats cancer using radiation therapy.

SURGICAL ONCOLOGIST

A surgical oncologist specializes in surgical care for cancer including melanoma. It is important to consult with a surgical oncologist who frequently performs surgeries for melanoma. They will evaluate the resectability of the cancer, help with surgical staging, and carry out the surgery, ensuring that you receive the best possible surgical treatment for your condition.

ADDITIONAL TEAM MEMBERS

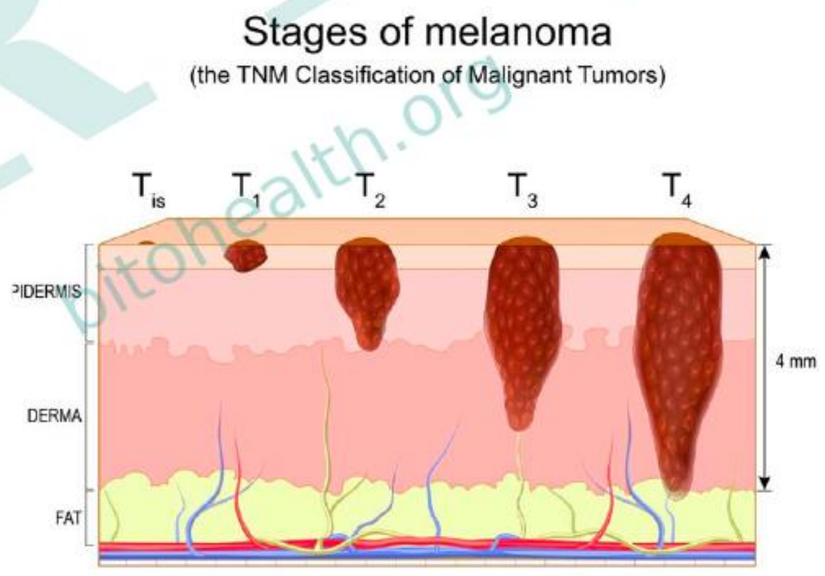
Other key members of your care team may include a dietitian, social worker, care coordinator, and genetic counselor, all of whom play important roles in your treatment journey

Staging for Melanoma (Cutaneous)

BRESLOW THICKNESS CATEGORY

Breslow thickness refers to the measurement of how deeply a melanoma has penetrated the skin, starting from the top layer of the epidermis down to the deepest point of tumor invasion. This depth is recorded in millimeters (mm) using a microscope and micrometer after a biopsy. The greater the thickness, the higher the risk of metastasis and poorer prognosis. This measurement plays a critical role in guiding decisions about sentinel lymph node biopsy, imaging studies, and adjuvant therapy. It is also a fundamental element of the AJCC TNM staging system for melanoma.

BRESLOW THICKNESS CATEGORY		
Description	**Thickness** (Depth of Tumor Penetration)	**T stage**
Melanoma confined to the epidermis	In situ	Tis
Thin Melanoma	≤ 1 mm	T1
Intermediate Thickness Melanoma	> 1 mm to ≤ 2 mm	T2
Thick Melanoma	> 2 mm to ≤ 4 mm	T3
Very Thick Melanoma	> 4 mm	T4



TNM SYSTEM (AMERICAN JOINT COMMITTEE ON CANCER (AJCC) AND THE INTERNATIONAL UNION AGAINST CANCER (UICC).

The primary staging system used for melanoma is the **TNM classification**, jointly developed by the **American Joint Committee on Cancer (AJCC)** and the International Union Against Cancer (UICC). This system is internationally recognized and provides a standardized framework for assessing the extent of melanoma spread. In the **TNM system**

T describes the depth of the primary tumor.
N indicates whether the melanoma has spread to regional lymph nodes (If so, where are they located and how many lymph nodes have melanoma?)
M refers to the presence or absence of distant metastasis (to distant organs such as the liver, bone, adrenal gland, or brain)

Each category is assigned a number or letter to provide more detail. These TNM components are then combined to determine an **overall stage,** ranging from:

Stage 0: Melanoma in situ (confined to the epidermis)
Stage I–III: Increasing levels of local and regional spread
Stage IV: Distant metastatic disease

In general, lower stage numbers indicate less advanced disease, while higher numbers reflect more extensive spread and worse prognosis