

# Skin Cancer

Prevention • Treatment • Support



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# Skin Cancer

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# Skin Cancer

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A close-up photograph of a dermatologist's gloved hand holding a dermatoscope against a patient's skin. The dermatoscope is a handheld device with a lens and a light source. The text 'Disease • Diagnosis • Management' is overlaid on the image in a bold, black font, with a teal horizontal line underlining the word 'Management'.

# Disease • Diagnosis • Management

The three most common skin cancers are: Basal Cell Carcinoma, Squamous Cell Carcinoma and Melanoma.

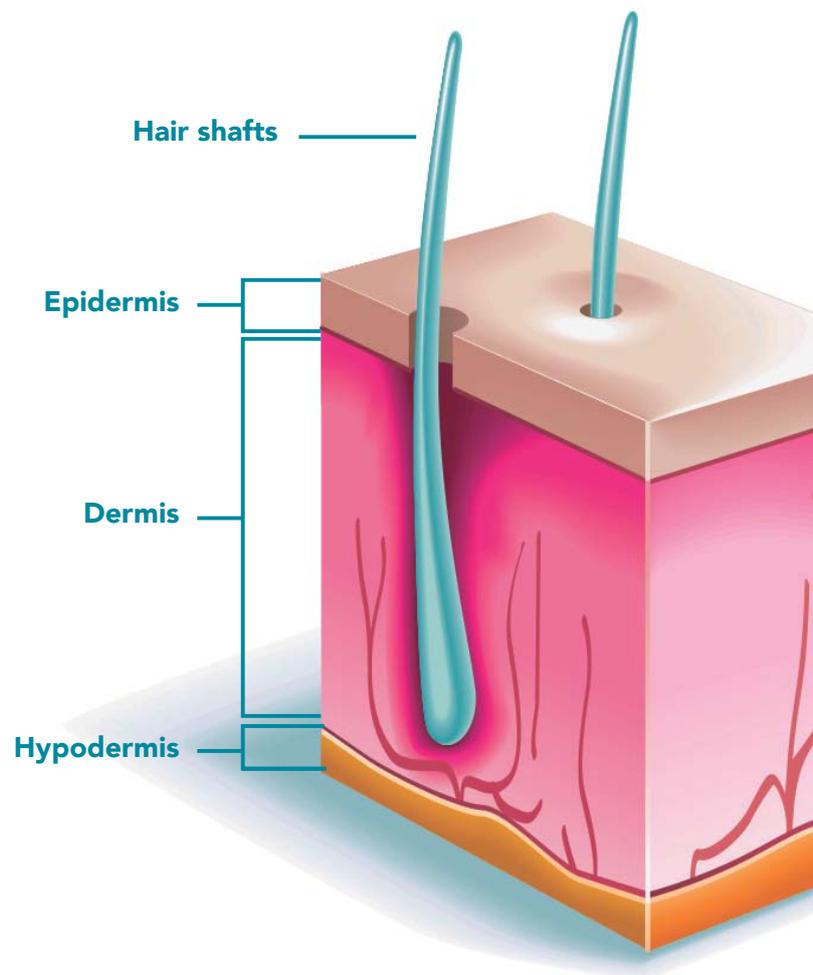
The risk of developing melanoma is higher among people older than sixty years. Melanoma also affects younger people. In fact, it is one of the most common cancers in young adults (especially young women).<sup>1</sup>



## The Skin

- The skin regulates body temperature and keeps moisture within the body.
- The skin protects other body organs and shields them against pathogens (harmful external agents).
- When exposed to sunlight, the skin also plays a role in producing vitamin D within the body.
- The skin is composed of three layers: the outermost epidermis, the supporting dermis and the hypodermis (or fat layer).
- Melanocytes, the cells which produce melanin responsible for skin color, are found in the epidermis.
- Regeneration and production of new skin cells occurs in the basal layer of the epidermis.

*The skin is the **outermost** layer covering your body. It is the **largest organ** in the body and has different functions.<sup>2</sup>*





## What Is Skin Cancer?

Skin cancers arise when the DNA of skin cells in the epidermis is damaged, resulting in uncontrolled growth of these injured cells.<sup>3</sup>

**UV radiation** (from the sun or from artificial tanning) is the direct cause of this damage.<sup>3</sup>

Different types of skin cancer are named after the type of skin cell from which they arise.

The three most common skin cancers are:

**Basal cell carcinoma** is the most commonly diagnosed and the most curable skin cancer.

**Squamous cell carcinoma** is the second most common form of skin cancer.

**Melanoma**, although less common, is the most serious form of skin cancer. If diagnosed early, it is almost always curable. However, if left untreated, melanoma can spread, or metastasize, to other parts of the body and cause serious illness and death.

Melanoma is associated with a high frequency of genetic mutations, such as BRAF, c-KIT and NRAS. They play a role in disease development.



## How Common Is Skin Cancer?

Worldwide, the incidence of both non-melanoma and melanoma skin cancers has been increasing over the past few decades. According to the World Health Organization, one in every three new cancers diagnosed is skin cancer.<sup>4</sup>

Skin cancer is preventable. It remains the most commonly diagnosed cancer in countries such as the United States, Canada, Australia and some European countries.

According to Skin Cancer Foundation Statistics, one in every five Americans will develop skin cancer in their lifetime.<sup>5</sup>

More than 3.3 million cases of skin cancer are diagnosed in the USA each year.<sup>6</sup> More than 400,000 new cases are diagnosed in Australia yearly as well as 76,000 new cases in Canada.<sup>7,8</sup>



## Risk Factors for Skin Cancer

- Fair or freckled skin, blond or light-colored hair, and light-colored eyes
- Repeated sunburns, particularly during childhood and adolescence
- Multiple skin moles
- Prolonged sun exposure as part of daily routine
- Personal history of skin cancer
- Family history of skin cancer
- Use of immunosuppressants, corticosteroids or other medicines known to make the skin more sensitive to the sun
- Artificial tanning, particularly in younger age and adolescence

The dose of ultraviolet (UV) radiation produced by artificial tanning devices is much higher than that of the sun. It is estimated to be ten to fifteen times above what would be expected in the midday sun.

Using these tanning devices, especially before the age of ten to fifteen, raises the risk of developing melanoma.

Melanoma with a BRAF genetic mutation is associated with younger age and is likely to appear in areas not commonly exposed to the sun.<sup>9</sup>

### Did You Know?

- **Artificial tanning** causes significant damage to your skin.
- Sunburns and tans are **signs of skin damage**; both are unsafe and better avoided.
- A '**base tan**' does not protect you from sun damage.

*Melanoma may also affect people who do not have these risk factors.*

# Skin Cancer



## Vitamin D

**Vitamin D is the sunshine vitamin!** It is essential for developing strong bones and maintaining optimal health. Nature's way of producing vitamin D is from sunlight exposure to your skin. The ultraviolet - B rays from the sun are the main source to begin this process. The other main dietary source for vitamin D comes from oily fish such as wild caught salmon. A person usually needs few minutes only of direct sun exposure to get the required dose of the sunshine vitamin.<sup>10,11</sup>

Ask your doctor about checking your vitamin D3 blood level.





## Skin Disease



### Basal Cell Carcinoma

*Basal cell carcinoma (BCC) is the most commonly diagnosed and the most curable skin cancer.<sup>12</sup>*



### Squamous Cell Carcinoma

*Squamous cell carcinoma (SCC) is the second most common skin cancer.<sup>13</sup>*



### Melanoma

*Melanoma, although less common, is the most serious form of skin cancer. If diagnosed early, it is almost always curable. However, if left untreated, melanoma can spread, or metastasize, to other parts of the body and cause serious illness and death.<sup>14</sup>*



## Basal Cell Carcinoma

*Basal cell carcinoma is the most commonly diagnosed skin cancer.*



### Origin

The basal cells of the epidermis, which are the small, round cells in the base of the outer layer of skin.



### Sites

Basal cell carcinomas commonly affect parts of the body that have had excess sun exposure, typically the face, nose, ears, scalp, neck, shoulders and back.

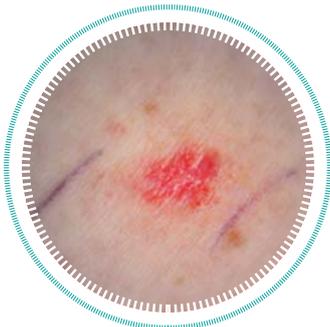


### Caution

People who had basal cell carcinoma once before are at higher risk of developing others over the years. It might occur in the same area or elsewhere on the body.

## How Does Basal Cell Carcinoma Start?

Basal cell carcinoma (BCC) has different presentations. In the beginning, the most frequent presentation is a skin-colored papule or a nodule with a rolled-in, pearly border and depressed or ulcerated center.



## Treatment

**The earlier the disease is diagnosed**, the easier it is to treat. Late detection, on the other hand, might cause disfigurement and damage to the surrounding tissues. Larger tumors require more invasive surgery with more extensive disfigurement.

- Surgical removal.
- Radiation therapy may be used to treat lesions on the face.
- Topical imiquimod cream (a prescription medication) may be used for low-risk, superficial basal cell carcinomas on the trunk, neck, arms, hands, legs and feet. This drug is applied to the skin where the cancer is located.
- Recently, two prescription medications (Vismodegib, Sonidegib) have been approved **in the USA** for the treatment of adult patients with locally advanced basal cell carcinoma (BCC) that has recurred following surgery or radiation therapy, or those who are not candidates for surgery or radiation therapy.



## Squamous Cell Carcinoma

*Squamous cell carcinoma is the second most common skin cancer*



### Origin

The flat cells forming the surface of the skin (called squamous cells).



### Sites

Squamous cell carcinomas may arise in any area of the body; however, areas with frequent sun exposure such as the rim of the ear, lower lip, face, bald scalp, neck, hands, arms and legs are the most commonly affected. The skin in these areas usually shows signs of sun damage such as wrinkling, pigmentation and loss of elasticity.



### Caution

Warning signs for squamous cell carcinomas include open sores or crusted skin. Sometimes tumors appear as thick red bumps or wart-like growths.

People with a history of basal cell carcinoma are more likely to develop squamous cell carcinoma.

## How Does Squamous Cell Carcinoma Start?

Squamous cell carcinoma (SCC) may start as a hard nodule or plaque with a surface crust that, if left untreated, eventually breaks down and forms a sore.

## Treatment

Squamous cell carcinomas are almost always curable. Delayed diagnosis and treatment may lead to deeper spread into the skin, causing damage and disfigurement (e.g., loss of nose, ear), and/or spread to other tissues and organs in the body.

Invasive squamous cell carcinoma treatment may include:

- Surgery for complete removal.
- Radiation therapy may be used alone or following surgery.
- Chemotherapy may be used for advanced cases and when surgery and radiation therapy are not possible.

Initial assessment of the regional lymph nodes and during follow-up visits is mandatory, as these tumors can spread to lymph nodes.





## Melanoma



### Origin

The melanocytes, which are the cells that produce melanin (the pigment coloring the skin, hair and eyes). Usually melanomas are brown or black; however, some tumors are skin-colored, pink, red, purple, blue or white.



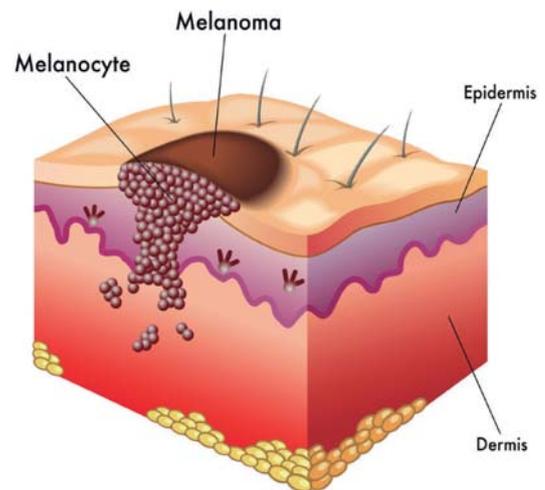
### Sites

In spite of the strong correlation between sun exposure and the development of melanoma, tumors can affect any part of the skin, including areas not usually exposed to the sun, such as the genitals or anal area. Other parts of the body, such as the mouth, eyes or nail beds may also be affected.

Men are most commonly affected on the back and chest, while women are more commonly affected on the back and legs. Melanoma grows through the skin into the fat below, and has a tendency to spread through lymph and blood. It spreads most commonly to the lymph nodes, skin, lungs, brain, spinal cord and liver, although it can potentially spread anywhere in the body.

*Melanoma is less common than other skin cancers, but it is also the most dangerous.*

*If diagnosed early, it is almost always curable. However, if left untreated, melanoma can spread to other parts of the body and cause serious illness and death.*



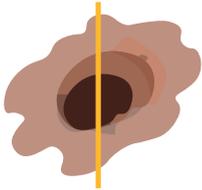
### How Does Melanoma Start?

Melanoma may evolve over weeks, months or even years. Initially it may take the shape of a new mole or freckle-like spot on the skin, or it might develop in an existing mole. Melanomas are usually dark-colored (brown or black); however, some tumors show a mixture of colors, including blue, grey and red. Irrespective of their risk for developing skin cancer, individuals should be proactive and assess their own skin on a regular basis for any changes.

Suspicious spots should be reported to a health practitioner.

Dermatology associations encourage individuals to learn the early warning signs of skin cancer – **ABCDEs of Melanoma** – and **to perform regular (monthly) skin cancer self-examination.**

## ABCDEs of Melanoma<sup>15</sup>



**A**

### Asymmetry

The shape on one side is different from that on the other side.



**B**

### Border

The border or visible edge is irregular, ragged and imprecise.



**C**

### Color

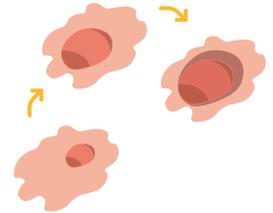
There is a color variation, with brown, black, red, grey or white within the lesion.



**D**

### Diameter

Growth is typical of melanoma. It can measure more than 6 mm, but may also be smaller (the size of a pencil eraser).



**E**

### Evolution

Look for changes in color, size, shape or symptoms, such as itching, tenderness or bleeding.

## When to Suspect a Mole?

Many people have moles. The number of moles differs from one person to another, but for the same person, most moles tend to look similar. A person suspects a mole if it starts to look or feel different.

## What to Do if a Spot or a Mole Looks Suspicious?

The family physician or dermatologist should examine any suspicious spot or lesion as soon as possible. The doctor will either keep it under close observation or schedule a skin biopsy (usually under local anesthesia). After the biopsy is taken, it will be analyzed by a pathologist to confirm the diagnosis of melanoma. If melanoma is confirmed, further genetic mutation analysis

can be done to show the changes that occur within the DNA of the melanoma cells.

Genetic mutations guide further treatment for advanced cases and determine the best options for biological targeted therapy and/or immunotherapy.<sup>16</sup>

*Discuss tumor mutation testing with your physician.*

## What Next if the Biopsy Indicates Melanoma?

If melanoma is confirmed, further surgery is usually required to ensure that all cancer cells at the site are removed.

Melanoma is almost always curable when diagnosed **very early** (Stage I or Stage II). Although melanoma is a less common form of skin cancer, it is the most dangerous as it can grow and spread to other parts of the body, where it can be hard to treat. Because of this, melanoma is the cause of most skin cancer deaths.

Treatment of melanoma differs according to the stage at which the disease was diagnosed.<sup>17</sup>

For very early stages, the treatment is usually surgery alone followed by regular follow-up.

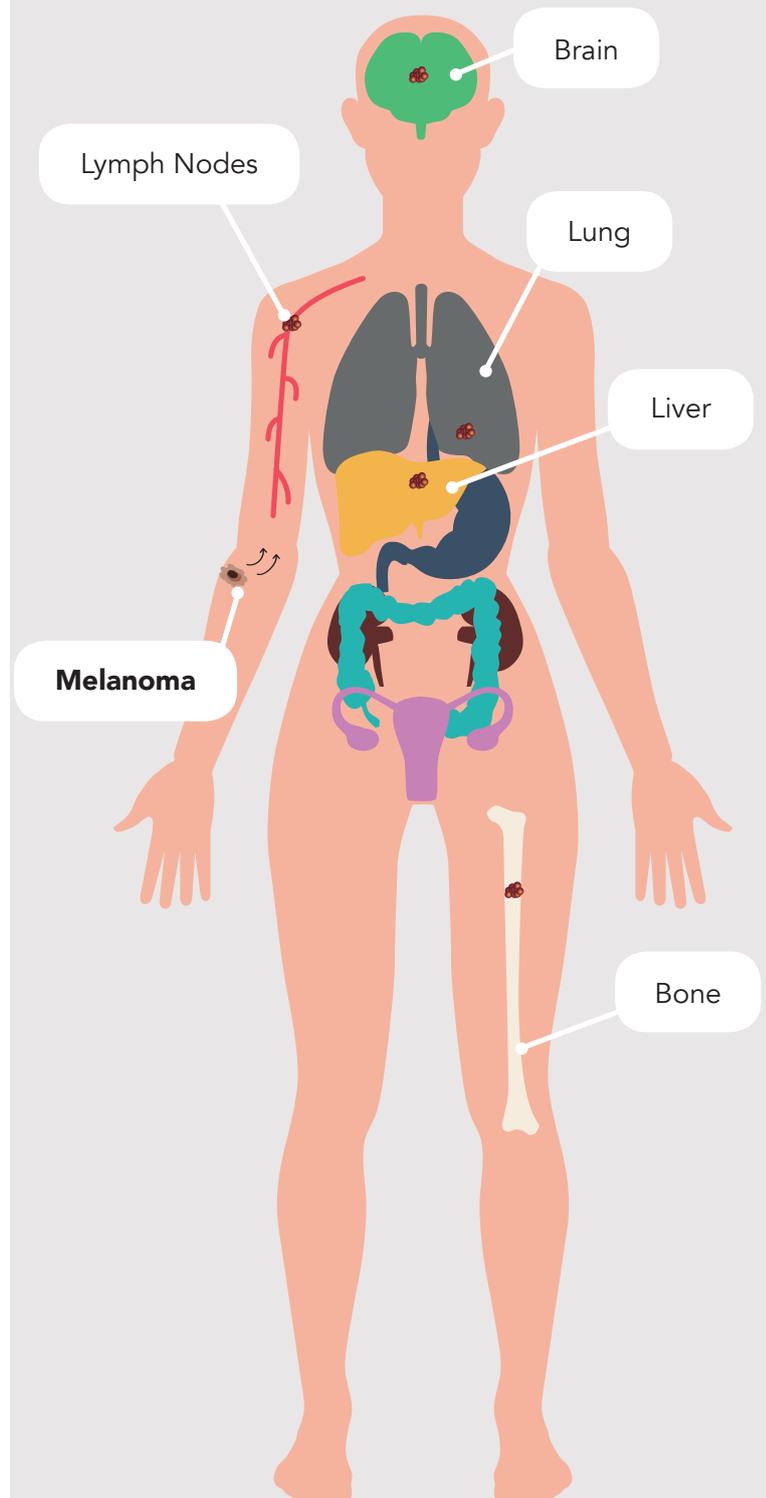
Radiation therapy may be added to the primary site and/or lymph nodes if the disease was larger or has spread to lymph nodes.

When melanoma cannot be fully removed by surgery (Stage III unresectable) or has metastasized (Stage IV), it is known as advanced melanoma. This is the most serious form of skin cancer. While overall metastatic melanoma survival rates have more than tripled since the 1970s, advanced melanoma is still one of the most difficult to treat cancers.

Before the introduction of targeted anticancer drugs, traditional chemotherapy was used to treat patients with advanced melanoma, but with limited success. Recently, targeted therapies have resulted in considerable improvement in the outcomes for certain people with advanced and metastatic melanoma. These drugs target specific genetic mutations such as BRAF and destroy cancer cells.<sup>18</sup>

Another option for advanced cases is immunotherapy. It works by stimulating the patient's own immune system to attack and destroy cancer cells.<sup>18</sup>

*The most common sites where melanoma can spread include the lungs, liver, brain, bones and lymph nodes.*





## Stages of Melanoma

Melanoma is categorized into four main stages based on the thickness of the cancerous tumor and how far it has spread. Doctors can determine the stage of melanoma by performing physical exams, biopsies and imaging tests such as CT or MRI scans. The four main stages of melanoma are:

### Stage I

The cancerous tumor has formed within the skin but is small.

### Stage II

The cancerous tumor is still localized. Due to its larger size, generally over one millimeter thick, and faster growth rate, it is called an intermediate melanoma. At this stage it has not been found in lymph vessels, lymph nodes or distant organs.

### Stage III

Resectable (removable) melanomas are cancerous tumors that have spread to lymph nodes, but can still be removed by surgery. There is no distant spread.

Unresectable (irremovable) melanomas are cancerous tumors that have spread beyond the skin to the lymph nodes, and surgery may not be able to remove all of the cancer. There is no distant spread.

### Stage IV

Also known as metastatic melanoma, the cancer at this stage has metastasized, or spread, to lymph nodes that are distant from the primary cancerous tumor and/or to organs, such as the lungs, liver, brain or bones.

Despite these staging definitions, not all advanced melanomas are the same. Your melanoma may have different genetic changes, also called mutations, making your disease uniquely personal.



## Current Treatment Options

### Surgery

Surgery is the main treatment option for removing most early-stage melanoma tumors.

### Adjuvant Treatment

Some earlier-stage melanomas, especially thicker melanomas, have a higher risk of coming back in another part of the body after surgery. Adjuvant treatment is sometimes added after surgery to try to prevent or delay recurrence.

High-dose Interferon Alfa 2b is used as adjuvant treatment for some patients after surgery.

Recently, newer adjuvant treatments are being tested. Patients with high risk of recurrence should discuss the possibility of taking part in a clinical trial with the treating physician.

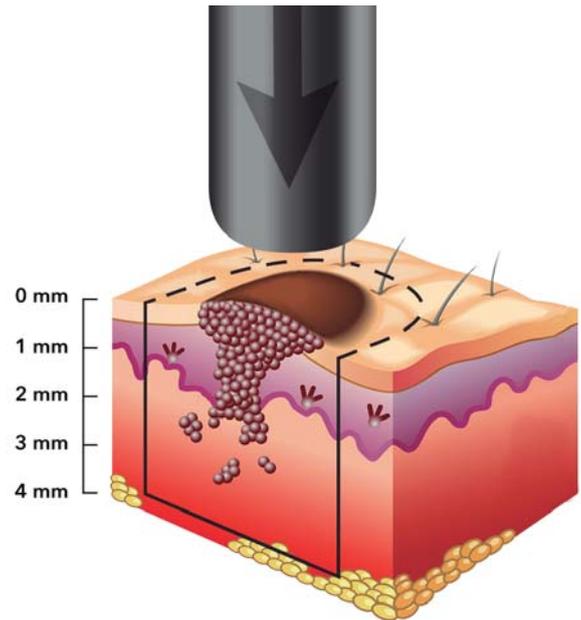
Radiation therapy is not often used to treat the original melanoma, but is sometimes used as adjuvant treatment following surgery to prevent recurrence or slow its spread.

### Chemotherapy

Involves oral or injectable drugs that kill cancer cells.

High-dose Interleukin, with or without chemotherapy, can be considered in fit young patients with metastatic disease.

Other options with limited responses include:



- Dacarbazine
- Temozolomide may be used especially in patients with brain metastasis
- Carboplatin
- Carboplatin and Paclitaxel

### Radiation Therapy

Uses high-energy rays, like getting an X-ray but with much stronger radiation, to kill cancer cells.

**Making the right treatment decision is difficult and it is important to speak with your doctor to understand the benefits and risks of all melanoma treatment options.**



## Genetic Mutations in Melanoma

*Personalized Treatment for Advanced Melanoma Is Not a “One Size Fits All” Disease*

Different genetic mutations have been identified and investigated over the past decade. Identifying these molecular targets of melanoma cells has radically changed how this disease is now treated and has significantly better outcomes for advanced cases.

A patient with advanced melanoma can have more than one genetic mutation. Melanoma is one of the cancers with the highest frequency of mutations. There are several melanoma mutations that can be tested for. Identifying the type is an important step in determining how to fight this disease.

BRAF mutation is found in nearly half of all advanced melanomas and is the most common type of genetic mutation associated with the disease. There are several forms of BRAF mutations, including V600E, V600K, V600D, V600G and V600R.<sup>6</sup>

Changes to the BRAF gene can stimulate the growth of melanoma cells. The BRAF mutation is the most common type of mutation in advanced melanoma. BRAF mutation is most common in patients whose tumors are not caused by chronic sun-induced damage.<sup>19</sup>

Several other mutations can be tested for, but they are still being investigated in clinical trials. These include NRAS and c-kit mutations. If a gene test is conducted and no mutation is detected, the tumor may be referred to as “Wild-type”.

**If you have advanced melanoma, talk to your doctor about your mutation status.**

### Targeted Therapies

Targeted therapies have been shown to extend overall survival in patients with melanoma expressing BRAF mutation. These drugs target tumor cells with the BRAF gene mutation preventing these cells from growing and spreading.

- Targeted therapies can shrink tumors in people with advanced melanoma.
- These drugs can also prolong the time before the tumors start growing again.
- With some BRAF-mutated patients, two targeted medications are used in combination to help improve effectiveness.

### Immunotherapy

Immunotherapy drugs stimulate a patient's immune system to destroy cancer cells.

Immunotherapies work irrespectively of patients having a particular genetic mutation.

- Some immunotherapies have been shown to be effective when used after treatment with a BRAF inhibitor.
- There are a number of different types of immunotherapies available, each having different approaches and different effects; CTLA-4 inhibitors and PD-1 inhibitors are two of these types.





## Treatment Side Effects

Treatments for cancer may cause side effects. There are many determining factors including:

- Type of drug
- Length of treatment
- Dose of drug

Different supportive treatments help minimize these side effects and most go away over time after the treatment ends.

**Always discuss and report any worries or side effects with your cancer care team to help them address these concerns.**



# Skin Cancer



## Prevention

Fortunately, skin cancer remains a largely preventable disease.

Simple steps and precautions can reduce the risk of developing skin cancer.<sup>20</sup>

**Overexposure to UV rays**, particularly during **childhood and adolescence**, is strongly correlated with the development of skin cancer.



## How to Protect Yourself



The UV index is higher between  
**11:00 AM - 4:00 PM.**<sup>21</sup>

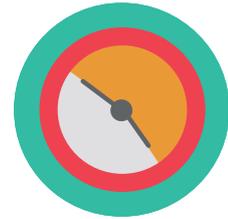
Sun protective measures are required whenever the UV index is 3.0 or higher.

Sun protection is important year-round, particularly from late spring to early fall.<sup>21</sup>

Do not forget that reflective surfaces such as water, snow, sand, concrete and ice increase your exposure and require the same protective measures.

Protection does not mean staying indoors; you can still enjoy outdoor activities while following sun protection measures.

**It is important to remember that a 'base tan' is a sign of skin damage. It does not protect you from the damage of sun exposure.**



Whenever you are going out in the sun, make sure to check your local weather channel for the UV index.



## How to Protect Your Skin from Harmful UV Rays

### Seek Shade

Seek shade whenever possible or create your own using umbrellas, trees, canopies, awnings, gazebos or portable tents.

Wear loose and closely woven fabrics to cover your arms and legs.



### Stay in the Shade

- If you cannot stay in the shade, create your own using umbrellas, trees or portable tents.
  - Wear loose clothing and cover your arms and legs.
  - Wear protective clothing that covers as much skin as possible when you're out in the sun. Clothing made from tightly woven fabrics is preferred. You should not be able to see through it when held up to a light.
  - Whenever out in the sun, apply sunscreen and lip balm with broad spectrum protection and a sun protection factor of SPF 30 or higher. Reapply according to product directions and after swimming, toweling dry or sweating.
- Apply sunscreen on cloudy days and during the winter months if you are involved in outdoor activities.
  - Sunscreen is available for infants under six months of age (avoid application to the mouth and eye area). It is always better to keep babies out of the sun; use shade and protective clothing to protect them from the sun's UV radiation.
  - Insect repellent and sunscreen may be used at the same time. Healthcare authorities recommend applying sunscreen first, followed by the insect repellent. Refer to the instructions on each product for proper use.
  - If you are wearing a baseball cap, do not forget to protect your ears and neck with sunscreen. Consider wearing a wide-brimmed hat that shades your face, ears and neck.
  - Protect your eyes by wearing sunglasses with 100% UVA and UVB absorption.

## Protect Yourself from Artificial Tanning

The risk of developing skin cancer significantly increases with the use of indoor tanning beds and sunlamps.

The best protection is to avoid them.



## How to Protect Your Children

Children and youth are more susceptible to the UV risks than adults as they are still in a dynamic state of growth.

The first and most crucial step is to teach them the risks of sun exposure and how to protect themselves from harmful UV rays.

Model by example: always apply sunscreen to yourself as well as your children.

Whenever your children are going outdoors for physical activity, physical education, recess or field trips, apply sunscreen and have them wear protective clothing.

You can also add sunscreen to the mandatory school supplies in their schoolbag.



## Skin Self-Examination

**1.** Using a mirror in a well-lit room, check the front of your body – face, neck, shoulders, arms, chest, abdomen, thighs and lower legs.

**2.** Turn sideways, raise your arms and look carefully at the right and left sides of your body, including the underarm area.

**3.** With a hand-held mirror, check your upper back, neck and scalp. Next, examine your lower back, buttocks, backs of thighs and calves. Your spouse/partner can help examine your back.

**4.** Examine your forearms, palms and fingernails, as well as the back of your hands and in between each finger.

**5.** Finally, check your feet – the tops, soles, toenails, toes and spaces in between.

**Check your skin regularly** and report any suspicious spots to your health practitioner. Whether you are at low or high risk for developing skin cancer, you should be proactive and assess your own skin regularly for any changes.

People are very successful at detecting melanoma on their own skin. More than half of melanomas are discovered by patients themselves or by family members.<sup>22</sup>

Checking your skin regularly improves cure rates. Lives can be saved.<sup>14</sup>

**A skin self-examination is simple and takes only ten or fifteen minutes once per month.**

### Watching your own back

Diagrams 1 and 2 are examples of how to use a full-length mirror and hand-held mirror to check your own skin.



Diagrams 3 and 4 are examples of having a partner check your skin.



## Warning Signs

Check with your doctor if you notice any of the following skin changes:



- A new growth or spot on the skin, such as a mole, a scaly patch or a lump.
- A change in size or appearance of an existing mole.
- A sore that does not heal.

A



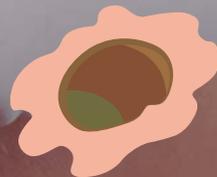
Asymmetry

B



Border

C



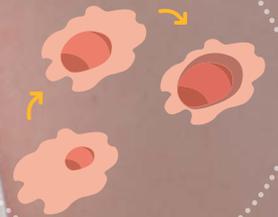
Color

D



Diameter

E



Evolution

# Skin Cancer



Make healthy choices every day.

Lifestyle changes may help you better cope with a skin cancer diagnosis.



## How Does Cancer Affect Your Emotional Health

You may feel scared, uncertain or angry about the unwanted changes cancer will bring to your life.

You may feel numb or confused. You may have trouble listening to, understanding or remembering what people tell you during this time. This is especially true when your doctor first tells you that you have cancer.

Patients, families and caregivers may face some degree of depression, anxiety and fear when cancer becomes part of their lives.

You can reduce your anxiety about treatment and side effects by taking action now. Talk to your cancer care team about the things that worry you. Learn as much as you can about the cancer, your treatment plan and how you might feel during treatment. Planning how you'll cope with possible side effects can make you feel more in control and ready for the changes that may come.<sup>23</sup>

### Things You Can Do to Help Deal with Your Emotions

- Ask for support from family, friends and others. Having someone who cares and will listen to you can be very helpful. Healthcare professionals (such as social workers, psychologists or other licensed health professionals) and support groups can be extra sources of inspiration.
- Gain spiritual support through prayer, meditation or other practices that help you feel more at peace.
- Pay attention to your physical needs for rest, nutrition and other self-care measures.
- Find ways to express your feelings, such as talking, music, painting or writing.
- Allow yourself private time and space.
- Walk or exercise. Be sure to talk with your cancer care team about your plans before starting a new exercise program or activity.
- Find out what helped other patients and families cope with cancer and/or talk with other people diagnosed with the same type of cancer.

**Make changes at home to create a healthier environment. Speak with your doctor about making healthy lifestyle choices.**



## How to Relieve Stress and Relax

Easy-to-learn techniques can help you cope with everyday challenges.<sup>23</sup>

- Meditation
- Rhythmic deep breathing
- Guided imagery
- Physical movement, such as dancing
- Support groups
- Journaling & Art therapy
- Hypnosis
- Biofeedback
- Adopting a new healthy lifestyle

Be sure to ask your doctor before engaging in any new activity or lifestyle change.

*Healthy Lifestyle, Nutrition, Sleep, Exercise and Meditation may help.*





## Nutrition

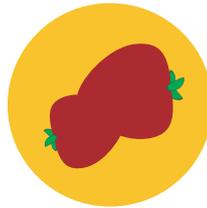
Good nutrition not only helps reduce your risk of developing cancer, but also helps you during your cancer journey. Eating the right variety of food maintains your strength and energy. It may also help you tolerate the side effects of treatment.<sup>24</sup>



*" We should eat only foods that our great grandmothers would have recognized. "*

*- Michael Pollan, author and professor*

You already know that healthy eating will have a positive impact on your life; we know what to eat and what is good for us, but after a cancer diagnosis or during cancer treatments, making healthy choices may become challenging, stressful and confusing.<sup>25</sup> Many questions will surface, such as **"Should I eat only organic? Do I give up dairy products? Do I need more fiber? Should I become a vegetarian?"** This challenge in your life can be embraced and accepted as a time to take back control, slow down and create a healthier you through nourishment and new habits for the rest of your life.<sup>25</sup>



### Should I Eat Organic Food?

Organic food is more expensive than non-organic food. In general, organic food will have reduced chemical content and will benefit and improve your health. To make informed shopping decisions, you need to understand what organic really means. The United States Department of Agriculture offers federal guidelines.<sup>25</sup>

**Produce** may be called organic if grown on soil that has been free of synthetic fertilizers and pesticides for three years prior to harvest.

**Meat** may be called organic if:

1. Animals are fed only 100% organic feed and forage.
2. No antibiotics or hormones have been administered.
3. Animals are raised in living conditions that simulate their natural habitat.

### Organic Guide

The Environmental Working Group publishes an annual shopper's guide that highlights the produce with the highest and lowest levels of exposure to hazardous pesticides. This guide ranks, in simple list form, which foods to purchase organic and non-organic.



## What About Fiber-Rich Foods?



### Fiber Basics

Fiber, also called roughage, is essential to your gut and skin health. It is found in the cell walls of plants and is the part of the plant your body cannot digest. There are two types of dietary fiber, and both are needed to create a healthy intestinal tract and reduce cancer risk. Because we are unable to digest fiber it bulks up the stool and reduces the time for the waste material to be in your colon. This helps to regulate your bowel habits and removes the unhealthy by-products from the foods you have eaten more efficiently. Fiber also nourishes the good bacteria we need in our gut to properly digest our food and stay healthy. Most fruits and vegetables contain both soluble and insoluble fiber.<sup>26</sup>

**1. Soluble Fiber**, also known as pectin, will dissolve in water and create a gel. You will find it in apples, citrus fruits, blueberries, oats and legumes. It helps lower cholesterol, and may slow down the breakdown and absorption of carbohydrates. This assists in controlling blood sugar and fiber, keeping you full for longer periods of time.<sup>26</sup>

**2. Insoluble Fiber**, or cellulose, does not dissolve in water. You find this fiber in cruciferous vegetables, nuts, wheat bran, flax seeds and dark green leafy vegetables. It promotes healthy bowel elimination.<sup>26</sup>

### Should You Take Fiber Supplements?

Ideally, choose fiber-rich foods over fiber supplements to benefit from their natural cancer-fighting phytochemicals. If you take a capsule form of fiber drink plenty of water. Do not take a fiber supplement with medications or vitamins, as it may inhibit their absorption.

### Tips for Adding Fiber

- Add leafy green vegetables and ground flax seeds in your favorite smoothie.
- Puree cauliflower, green peas or carrots and add them to your favorite tomato sauces or meatloaf.
- Adopt “Meatless Mondays” into your routine. Go all veggie for one meal or even one day if you feel confident.
- Try wholegrain pastas or brown rice. Quinoa pasta is higher in protein.
- Sprinkle nuts or seeds, such as sunflower or pumpkin varieties on your salad or main meal.

**The National Cancer Institute recommends consuming 20-30 grams of fiber per day.<sup>27</sup>**



## Food Groups to Avoid



**Processed Cured and Smoked Meats** such as bacon, hot dogs, sausage and some deli meats. Carcinogens are substances that cause cancer. The International Agency for Research on Cancer (IARC) has classified processed meat as a carcinogen. These foods are preserved with nitrates, which, after consumption and digestion, change into cancer-causing nitrosamines. If occasionally you would like bacon with your eggs, look for an uncured and nitrate-free brand.<sup>28</sup>

**Trans Fats** are created when hydrogen is added to liquid vegetable oil to make it solidify. When used to prepare foods it affordably prolongs shelf life, improves texture and taste, but it also creates cravings for more high calorie, fat laden foods. The trans fats are seen as foreign to the body, and they interrupt necessary, healthy metabolic processes. Trans fats are known to promote heart disease, obesity and cancer. Common foods with added trans fats include crackers, pastries, baking mixes, cookies, doughnuts and ready-to-eat frozen foods.<sup>28</sup>

**Refined Sugars** such as white and brown sugar, sucrose, and high-fructose corn syrup.

Research has shown that cancer cells derive energy from sugar and it is the sugar's relationship to insulin levels and related growth factors that may influence cancer cell growth. Healthier choices found in the grocery or natural health food store include: maple syrup, honey, brown rice syrup and stevia.<sup>28</sup>



## Food Safety During Treatments

Food safety is extremely important. Your immune and gastrointestinal systems undergo changes that may make you more susceptible to food-borne illnesses.

Certain foods have a higher risk of carrying bacteria and parasites that may cause illness during or after chemotherapy treatments.

Storing food in the refrigerator does not prevent bacterial growth, it only delays growth. Speak to your healthcare team for specifics about how to handle, prepare and store your food, and for how long you will need to take these precautions.



### Foods to Avoid when on Chemotherapy

Food safety is extremely important when you are undergoing chemotherapy and radiation treatments.<sup>29</sup>

- Unwashed or unpeeled fresh fruits, berries and vegetables
- Raw bean sprouts
- Raw or undercooked beef
- Cold hot dogs or deli lunch meat (cold cuts)
- Raw or undercooked shellfish
- Raw and smoked fish
- Unpasteurized beverages, such as raw milk and unpasteurized fruit juices
- Cheeses made from unpasteurized milk and soft based cheese
- Foods made with raw eggs
- Raw nuts or raw nut butters



## Food Handling Rules of Thumb

- Wash your hands for thirty seconds with soap and water before and after food preparation.
- Use paper towels to clean kitchen surfaces with an antibacterial spray before and after food preparation.
- Do not use wooden cutting boards.
- Clean off the top of canned goods prior to opening them.
- Reheat leftovers to 165 degrees Fahrenheit / 74 degrees Celsius.
- Do not eat leftovers older than two days.
- Store food on refrigerator shelving; it is cooler than the door-shelf temperature.
- Avoid buffets and salad bars at restaurants.





## Exercise

### Exercise Is Essential

If you have been diagnosed with skin cancer or are currently undergoing treatment, being physically active is essential to enhancing your quality of life.<sup>30</sup>

Cancer-Related Fatigue (CRF) is defined as a “distressing, persistent, subjective sense of physical, emotional and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent physical activity and interferes with usual function”.<sup>30</sup>

It is important to note that this type of fatigue is not alleviated through rest

and is the most common symptom experienced by patients. It sounds counterintuitive, but a growing body of research has shown dramatic improvement in the psychological and physical health of patients who have participated in programs combining aerobic and resistance activities.

The American College of Sports Medicine, the largest sports medicine and exercise science organization in the world, now recommends tailoring a program to your current abilities and using exercise as therapy to reduce cancer-related fatigue.<sup>31</sup>





## Exercise After Checking with Your Doctor

If you have not been physically active or suffer from other health-related conditions such as cardiac disease or metastatic cancer, you may want to consider a medical evaluation by a healthcare professional.

Consider a referral to an exercise specialist in your community with experience working with cancer patients and survivors. The American College of Sports Medicine offers Cancer Exercise Trainer certification.

For a successful and sustainable exercise regimen, find easily accessible activities that you enjoy and enlist an exercise buddy.

## Other Potential Benefits<sup>30</sup>

Exercise can improve:

- Memory
- Span
- Pain
- Depression
- Blood pressure
- Attention
- Sleep disorders
- Anxiety
- Balance

Initiate a conversation with your primary care physician or oncologist for further information to safely increase activity before, during and after your cancer treatments.

## Exercise Precautions<sup>30</sup>

If you have any of the following conditions you must consult your cancer care team about exercise precautions:

- Extreme fatigue
- Anemia or low red blood cell count
- Fever or infection
- Swelling or drainage around wound or radiation site
- Neutropenia or low white blood cell count
- Swollen extremities



## What Is Aerobic Exercise?

Aerobic exercise is a physical activity using your large muscle groups that, over time, will increase your heart and breathing rate.

This response improves your heart and lung capacity in order to deliver more oxygen to your muscles that is necessary to improve stamina and mobility. Your brain will release chemicals called endorphins that may help to diminish pain and increase your sense of well-being.

Examples of aerobic activity include walking, swimming, stair climbing and bicycling.



## What Is Resistance?

Resistance training is a physical activity to improve muscular strength and tone while lessening muscle waste.

When your muscles repeatedly contract to overcome a force, you build muscle mass, improve performance and balance, and increase bone density. You do not need to go to the gym to benefit from this style of exercise.

Weighted balls or medicine balls, and resistance bands are portable and easy to use safely at home and the office.



## Mindfulness-Based Exercise

Restorative yoga, a light exercise, is a series of gentle postures, stretching and breathing techniques that cancer patients and survivors are using to help balance the body and mind.<sup>32</sup>

**Yoga** has been shown to promote flexibility, stamina, sleep and well-being in patients receiving radiation treatments. It develops new ways to cope with stress and accept a changing body image. Doctors are beginning to recommend yoga as a form of therapy for their patients. Because yoga can be done standing, sitting and lying down, patients of all ages with cancer-related fatigue and advanced disease report physical and psychological benefits.



## Movement Tips

**Sedentary lifestyle leads to increased fatigue and muscle weakness!**

- Commit to making small changes and schedule your activity time.
- Listen to your body; you may need more rest than prior to your cancer diagnosis.
- If you are undergoing chemotherapy that lowers your immunity, it may be advisable for you to stay out of a public gym and exercise at home.
- Remember to not expose the sensitive skin areas from surgery or radiation to chlorine in a pool or hot tub, a lake, or the ocean until the incision has fully healed. Your physician will advise when it is safe.
- Combine exercise and relaxation techniques for a powerful boost in your overall energy.
- Stay hydrated; drink a glass of plain water before and after indoor or outdoor exercise.





## Meditation

### Meditation / Relaxation

#### *Stress Is Not Going Away!*

Stress is inevitable. People under stress are more susceptible to viral illness and infection, and it may need more time to recover from surgery. Irritability, headaches, fatigue, anxiety, upset stomach and insomnia may all be symptoms from long-standing or chronic stress. The good news is you can learn methods to return your body and mind to a pre-stressed state of balance.<sup>33</sup>



### Can You Elicit Relaxation?

Yes, it is called the "Relaxation Response". It was coined and scientifically studied by **Herbert Benson, M.D.**, founder of **Harvard's Mind – Body Medical Institute**. Research has shown that engaging the Relaxation Response counteracts the harmful physiological effects of stress. Techniques to elicit deep relaxation include guided imagery, visualization, meditation, progressive muscle relaxation, massage, breathing techniques, prayer, Tai Chi, Qi Gong, and yoga.



## What Is Meditation?

The ancient practice of meditation refers to a wide variety of techniques for calming the overactive mind. It is a taming exercise for the mind, that when practiced regularly, it develops emotional positivity.<sup>34</sup>

Scientific studies on meditators using modern-day brain-wave monitoring technology have demonstrated tangible changes in the structure of the brain that is important for healthy cognitive and emotional processing.

There are many forms of meditation. Some require sitting quietly while other styles involve easy movement, such as with Tai Chi, Qi Gong or walking meditation.

With regular practice it will help you improve your clarity around making decisions, you become better prepared to cope with the stressful situations around the challenges following a skin cancer diagnosis.

See further down for details on various techniques for meditation.



## Meditation Benefits

- Meditation has been well researched, and published studies suggest that adults and children may gain relief from the symptoms of anxiety, depression, chronic pain and sleep disruptions.
- With regular practice of meditation, your ability to concentrate will improve and the fear of a reoccurrence will lessen.
- As the nervous system returns to a more balanced and relaxed state, the body produces less stress hormones and your internal personal resources soar. An inner glow returns, and may even look years younger!
- It may take time for you to notice the benefits, but gradually and with daily practice, you will better understand your thought processes and learn to respond to challenges in a more positive healthier way.

### What Does Mindfulness Mean?

By definition, mindfulness means being intentionally aware of your thoughts and feelings in the moment. Regardless of whether the thought is pleasant or painful, you do not judge it as positive or negative, but instead observe it and allow the thought to move through the mind. This keeps you from thinking about the past or the future. You can often cause more stress to your body and mind by multitasking or becoming preoccupied with ninety-nine different things you think you should be doing.<sup>35</sup>

### Relaxation Techniques

In your busy, overscheduled day, it is difficult to find time to relax. There is no single technique that will elicit the Relaxation Response in everyone. You may also find it is more interesting and motivating to vary the techniques.

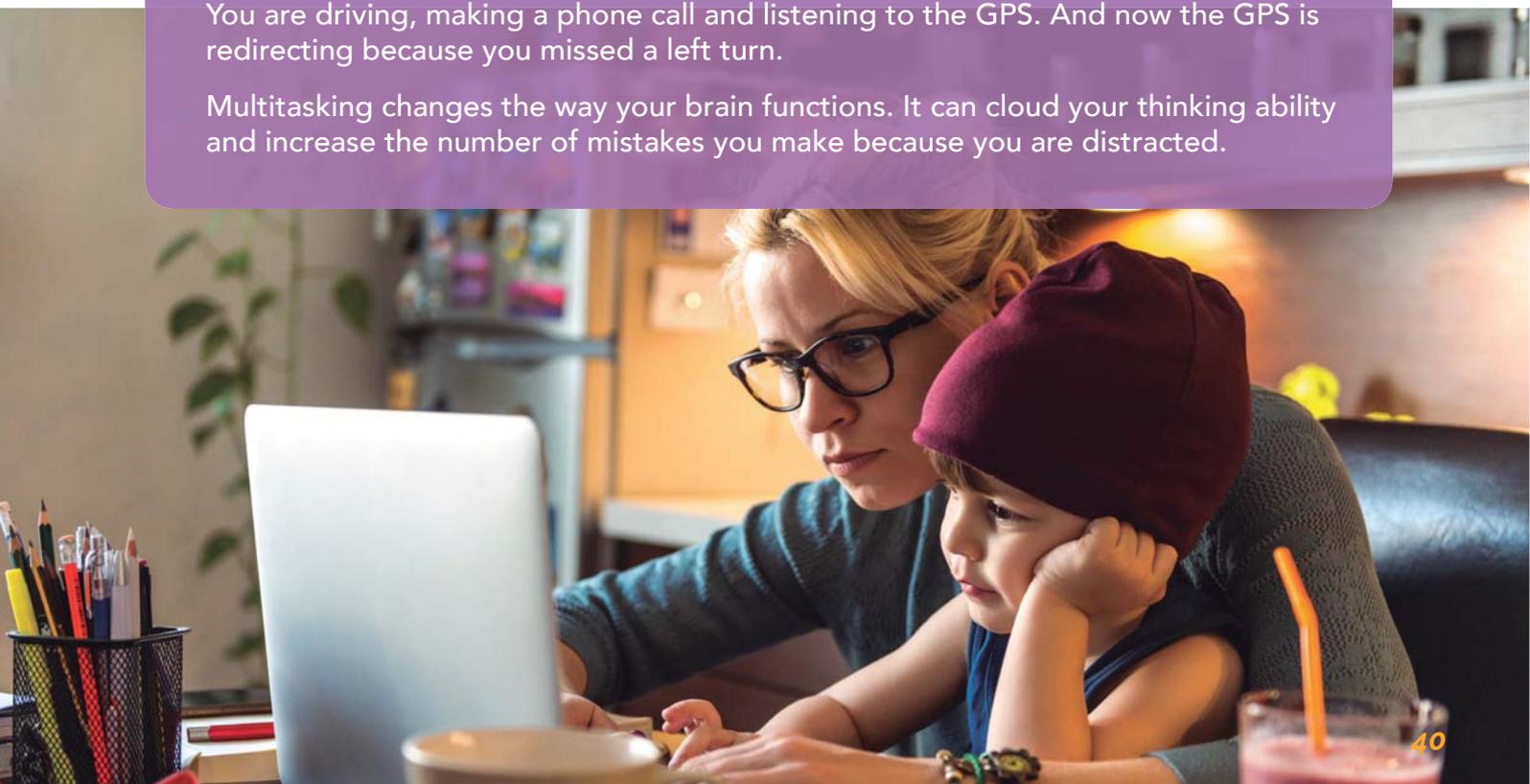
**Keep in mind, relaxation is not about watching TV or taking a nap; it is about making time to use a technique to reduce the damaging effects from stress overwhelming your nervous system.**

It will take practice and experimentation in various relaxation techniques to see what best fits into your current situation and lifestyle.

### Does This Sound Familiar?

You are driving, making a phone call and listening to the GPS. And now the GPS is redirecting because you missed a left turn.

Multitasking changes the way your brain functions. It can cloud your thinking ability and increase the number of mistakes you make because you are distracted.



### 1. Progressive Muscle Relaxation (PMR)

When the body reacts to stress and anxiety, it can create muscle tension, which can lead to muscle pain, headaches and general fatigue. PMR is a method to reduce built-up muscle tension. The technique teaches you a sequence on how to tense muscle groups and relax them to bring your body and mind back into a state of equilibrium. The muscle sequence frequently starts at the feet and progressively works up to the head.

### 2. Visualization or Guided Imagery

This method teaches you to imagine your favorite peaceful place using your five senses (sight, smell, touch, taste and hearing). Your imagery may include feeling the sun's warmth on your shoulders and hearing the birds singing. The safe and calming picture you create brings you into a state of deep relaxation, allowing for the release of tension. This relaxation style can be done on your own or while listening to a recording assisting you through the visualization.

### 3. Deep Breathing

Deep breathing is a powerful and simple relaxation technique that can easily be incorporated into your daily routine. When you are under stress, you breathe in a very shallow manner, which negatively influences your body and mind. Learning to breathe deeply and mindfully will help you diffuse emotional energy and restore inner calmness.

### 4. Tai Chi

This gentle Chinese practice is an ideal physical and almost meditative exercise for patients undergoing skin cancer treatments. Through slow, flowing physical movements, the body and mind come into a new alignment that teaches you to respond mindfully to forces out of your control. Tai Chi also assists in stretching and strengthening the body.

## Do You Need a Teacher?

Some clinics and hospitals offer meditation classes in their cancer centers. To get the best results from any of the techniques you may want to contact a qualified teacher. Always ask about how long they have been teaching, what their credentials are in the specialty and how long have they been working with cancer patients. You want to feel a connection with the teacher and be able to receive ongoing support as necessary.<sup>36</sup>

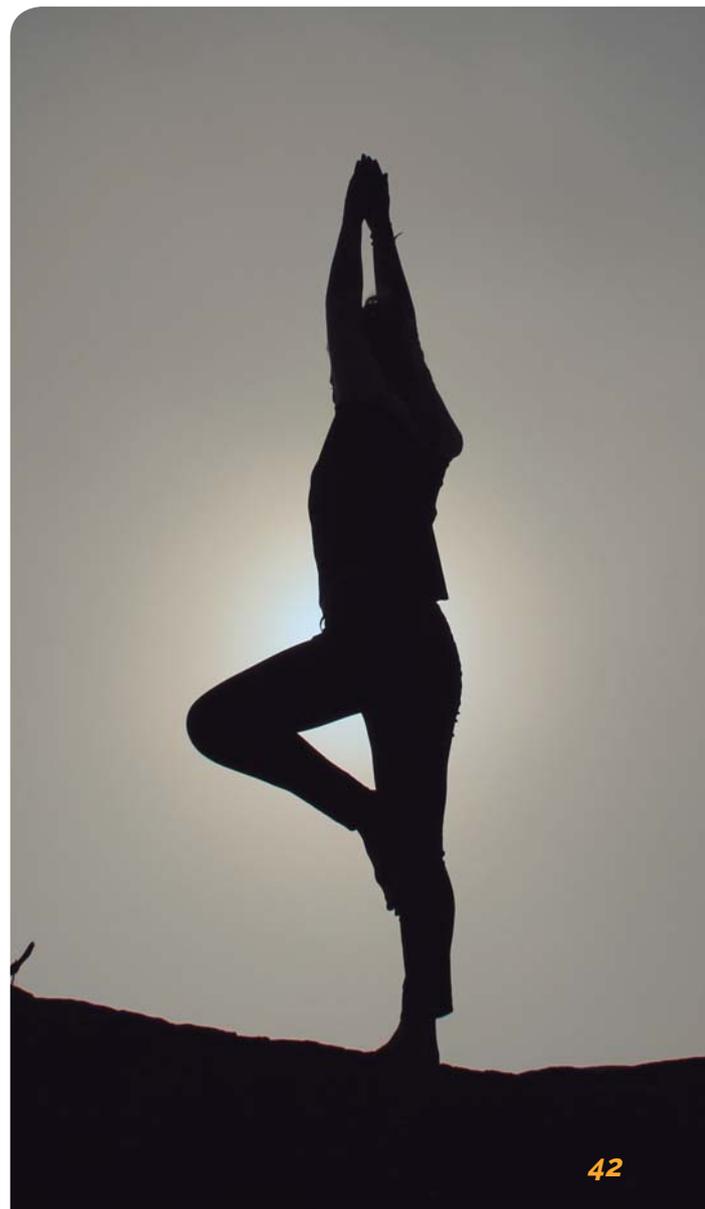
### How to Select a Technique

Allow six to eight weeks of practicing a technique before you dismiss it. Be patient; if you do not like it or do not find it beneficial, then move on to another practice. Do not let the practice become a stressor.



## Factors to Consider

- How much daily time do you have to devote to a practice?
- What technique appeals to you and fits into your present lifestyle?
- Do you prefer to be alone or in a group or classroom setting?
- What is the initial and continuing monetary cost for the new practice?
- What level of physical activity is involved?





## Sleep

A skin cancer diagnosis can take a toll on your emotional and physical wellbeing and may lead to sleepless nights.<sup>37</sup>

Developing balanced sleep patterns is essential while undergoing skin cancer surgery, radiation or chemotherapy.

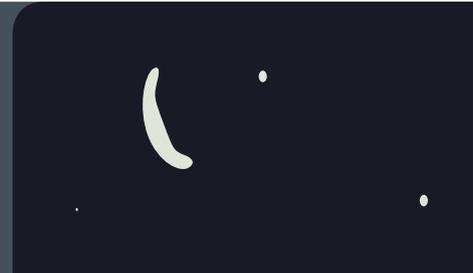
With practical strategies and information, you will correct imbalances and develop healthier sleep patterns for the rest of your life.

### Why Is Sleep Important?

Sleep affects the quality of your life. It plays one of the most critical roles in maintaining your physical and emotional health. Quality of sleep will directly influence your overall energy, mood, memory, appetite, metabolism and immune system. During sound sleep, the body is able to release stress and anxiety, restore alertness, improve wound healing and regenerate your skin. We create metabolic waste products from the foods we eat. A deep sleep is necessary for the body to effectively eliminate these digestive by-products. This process detoxifies the body and will help strengthen the immune system which may in turn assist the body in inhibiting cancer growth.



“ According to the National Cancer Institute, almost **50%** of cancer patients will develop insomnia or other sleeping difficulties.<sup>38</sup> ”

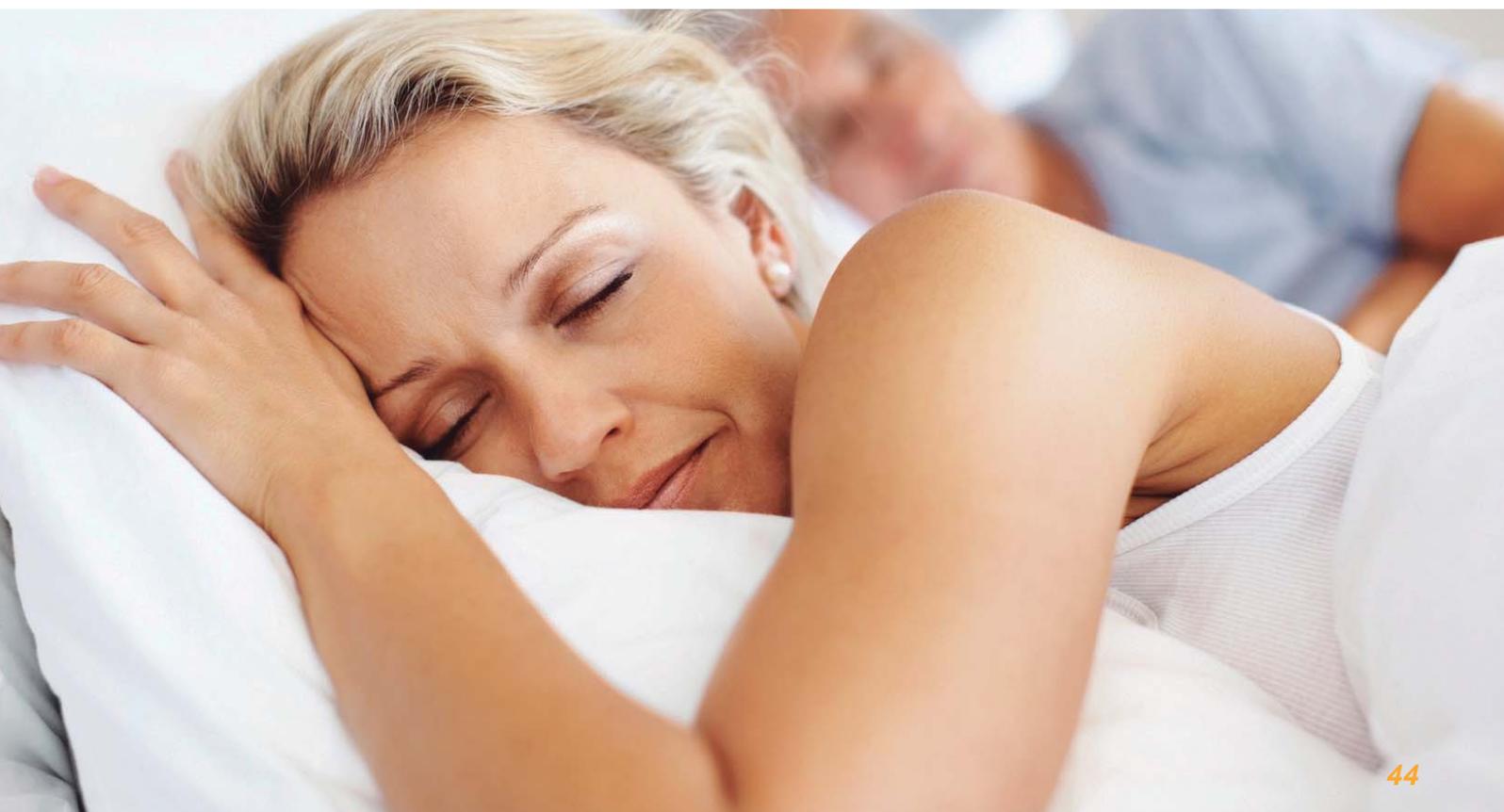


## Sleep Facts

- Sleep requirements vary between individuals.
- The average healthy adult will need between seven and nine hours.
- During cancer treatment, you may need extra sleep due to poor sleep quality and short sleep duration.
- Maintain a consistent bedtime, as the body likes routine.

## Napping

- Napping is not a sign of weakness or laziness. While undergoing skin cancer treatments, you may feel more fatigued and require extra sleep during normal waking hours.
- A late-morning or mid-afternoon nap may improve your wellbeing and alertness.
  - The ideal length of time for a nap is ten to thirty minutes.
  - A nap longer than thirty minutes may make you feel groggy.<sup>39</sup>





## What Is Insomnia?

Insomnia is having difficulty falling asleep when you first get into bed or you may awaken frequently during the night and have trouble falling back to sleep. Awakening too early in the morning, staring at the clock and not feeling rested upon rising are also signs of insomnia.

### Contributing Factors to Insomnia Development:

- Caffeine and nicotine are both powerful stimulants that may keep you awake or prevent you to go into the deeper restorative stages of the sleep cycle.
- Drinking alcohol in the evening may cause you to feel sleepy at first, but may later create fragmented sleep patterns, causing you to wake up frequently throughout the night.
- Heartburn or Gastro Esophageal Reflux Disease (GERD) caused by spicy or fatty dinnertime foods may keep you from falling asleep or wake you up in the middle of the night.
- Evening use of the computer and television during the hour before bedtime can be overstimulating and interfere with sleep.
- Late-afternoon napping after 4:00 PM may lead to a restless night. Ideally, nap in the late-morning or mid-afternoon.
- Side effects from medications, chemotherapy and radiation treatments.



**One rule of thumb is to maintain a bedtime and morning ritual: go to bed at the same time every night and wake up at the same time every morning.**

### Promote Restful Sleep

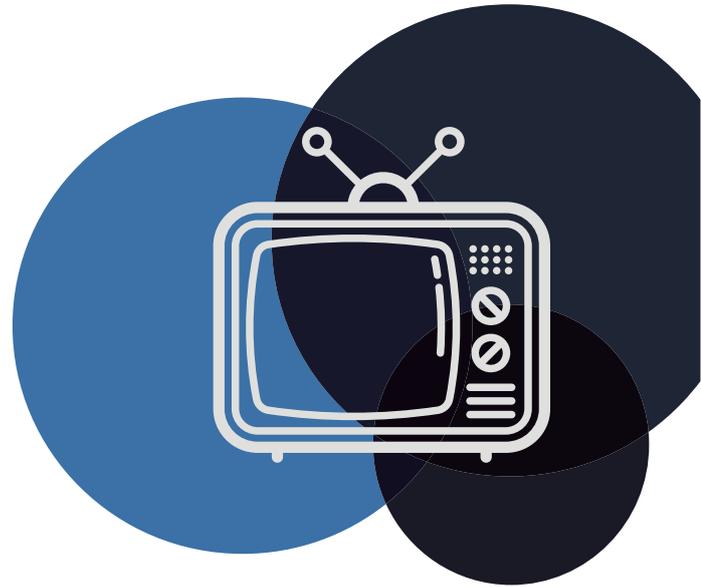
Create a healthy sleep environment by making it comfortable to you. Optimize and tidy up your bedroom; ideally the room should be clean, dark and quiet, and the best temperature is between 60-67 degrees Fahrenheit. Playing soft sounds from nature or classical music will be relaxing and help to minimize noise from the outside.

Try not to bring work-related materials into your bed, this will keep your mind thinking and in problem solving mode. Before getting into bed write down a list of outstanding issues or a "to-do" list for the next day, and do not look at it again until the following morning.

**Always talk to your healthcare provider about the possible underlying causes of insomnia.**

### Did You Know?

If you fall asleep with the television playing in the background, your brain is still alert. It is trying to process the sound, which results in a lighter and less restful sleep.



### The Sleepy-Time Bath

Epsom salt is a naturally occurring mineral compound of magnesium and sulfate, which is highly absorbable through the skin. Magnesium promotes a feeling of calm and relaxation. An Epsom salt bath reduces inflammation in the body caused by toxins, chemicals and radiation, and may promote sleep. You can purchase Epsom salts at your local pharmacy, super markets and health food stores. Presented varieties are available in spearmint, eucalyptus and lavender.<sup>40</sup>

**Recipe:** Fill the bathtub with enough warm water, not too hot, to cover your body, and add 2-3 cups Epsom salts. Enhance the environment by playing your favorite relaxing music. Soak for fifteen to twenty minutes and then towel dry. Follow the bath with a cool glass of water or a cup of soothing herbal tea.

You may also receive the benefits from a foot soak. Add ½ cup of Epsom salts to a plastic tub, fill with water and soak your feet for fifteen minutes.

Please check with your physician first. Do not bathe if you have any unhealed wounds, have high or low blood pressure or are feeling weak.





## Good Habits

### ● **Avoid consuming caffeinated beverages and foods from 3:00 PM onwards.**

Coffee, tea, energy drinks and carbonated sodas are known caffeinated culprits. Caffeine is found in cocoa beans and is therefore a naturally occurring substance in chocolate, but some commercial candies have been fortified with additional caffeine. Over the counter pain relievers may contain caffeine, read the label. Certain gum and mints contain the same amount of caffeine as a cup of coffee.

### ● **Drinking a soothing herbal tea or a hot cup of water with lemon in the evening can have a natural relaxation effect.**

Chamomile is a common herb that calms the body and mind, and it is easy to find in tea bag or loose leaf form. Steep for ten minutes and sip one hour before bedtime.

### ● **Nicotine is a powerful stimulant and may cause insomnia.**

Avoid nicotine in cigarettes, cigars, pipes, chewing tobacco and smokeless tobacco two hours before bedtime.

### ● **Eating smaller and more frequent meals throughout the day will lessen heartburn or GERD.**

Try to sit upright for thirty minutes after eating to lessen the stomach acid from backing up into your esophagus which causes heartburn. Foods that may increase heartburn include spicy or fatty foods, citrus, raw onions, tomato products and chocolate. Alcohol and nicotine may aggravate GERD as well. Always take your medications with water. Elevating the head of your bed, with wooden blocks under the legs, by 6-8 inches may diminish heartburn symptoms. If you need a small snack before bedtime try a few bites of cooked oatmeal or rice.<sup>41</sup>

### ● **During your cancer treatment, your body may require extra rest.** Taking a nap of no more than thirty minutes and before 4:00 PM may be all you need to go from fatigued to fantastic.



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