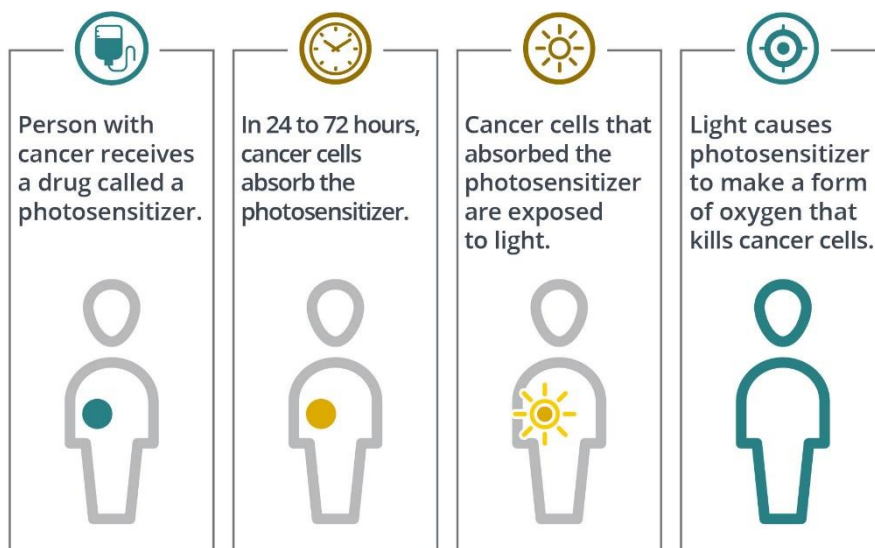


# Understanding Photodynamic Therapy (PDT)

## What is photodynamic therapy?

Photodynamic therapy (PDT) is a treatment that combines a special agent called a photosensitizer (porfimer sodium/Photofrin®) and a particular type (wavelength) of light to kill cancer cells. The photosensitizer is injected and given time to build up in cancer cells, which makes them more sensitive to light. When the cancer cells are exposed to that particular type of light, the cancer cells die. Neither the photosensitizer nor the light can destroy the cancer cells alone – they must be used in combination. Clinical studies show PDT can prolong survival for people whose lung cancer cannot be surgically removed and significantly improve quality of life.

## PHOTODYNAMIC THERAPY



[cancer.gov/about-cancer/treatment/types/photodynamic-therapy](http://cancer.gov/about-cancer/treatment/types/photodynamic-therapy)

## How is PDT used to treat cancer?

1. We inject a photosensitizing agent into your blood, such as Photofrin®, and it is absorbed by cells all over your body.
2. Approximately 24 - 72 hours after the injection, most of this agent has left the normal cells, but it is still in the cancer cells.
3. At this time, the special light is directed at the tumor.
4. The agent in the cancer cells absorbs the light and makes an active form of oxygen (oxygen radical).
5. The oxygen radical kills the cancer cells.

In addition to directly killing cancer cells, PDT may shrink or destroy tumors in 2 other ways:

- The photosensitizer agent can damage blood vessels in the tumor and prevent the cancer cells from getting the nutrition they need.
- PDT may activate your immune system to attack the tumor cells.

The light used for PDT can come from a laser or other sources of light. Laser light can be directed through fiber optic cables (thin fibers that transmit light) to deliver light to areas inside the body. For example, a fiber optic cable can be inserted through a thin, lighted tube used to look at tissues inside the body (endoscope) and guided into the lungs or esophagus to treat cancer in these organs. Other light sources include light-emitting diodes (LEDs), which can be used for surface tumors, such as skin cancer. PDT is usually performed as an outpatient procedure. PDT may be repeated, and may be used with other therapies such as surgery, radiation, or chemotherapy.

### **Why is PDT used to treat lung cancer?**

The photosensitizing agent Photofrin® is used in PDT to treat or relieve the symptoms of non-small cell lung cancer.

Photofrin® is used:

- to treat non-small cell lung cancer in patients who can't have the usual treatments
- to relieve symptoms when non-small cell lung cancer blocks your airways

### **What are the benefits and risks of PDT?**

#### **Benefits**

- Provides a treatment option for those who cannot have lung surgery.
- Photodynamic therapy limits damage to healthy cells because the photosensitizers tend to build up in cancer (abnormal) cells and the light is focused directly on them.
- Photodynamic therapy does not cause scarring of the skin.
- May significantly improve the quality of life.

#### **Limitations/Risks**

- PDT cannot be used in people with certain blood diseases (acute intermittent porphyria) or allergies.
- The light needed to activate most photosensitizers cannot pass through more than 1/3 of an inch (about 1 centimeter) of tissue. This means PDT is usually used to treat tumors on or just under the skin or on the lining of internal organs or cavities.
- PDT is less effective in treating large tumors, because the light cannot pass far into these tumors.
- PDT is a local treatment and generally cannot be used to treat cancer that has spread (metastasized) to distant areas of the body.
- PDT can harm normal cells in the treatment area and cause side effects.

## What are the possible side effects?

- **Photosensitivity** is the most common side effect of PDT. Photofrin® makes the skin and eyes sensitive to light (photosensitive) for approximately 6 weeks after treatment. During this time, you must avoid direct sunlight and bright indoor light because it may cause a skin reaction similar to a bad sunburn. Some people find the need to stay out of the light difficult. See the photosensitivity section below for how to manage the condition.
- **Swelling, pain, burns, and scarring** may occur even though damage to healthy tissue is minimal.
- **Fever**
- **Coughing**
- **Shortness of breath or pain during breathing**
- **Infections (pneumonia, bronchitis)**

## How do I manage photosensitivity?

- Your skin and eyes will be very sensitive to bright light such as:
  - direct sunlight
  - lightbulbs that are not covered by a lampshade and are very close to your skin
  - lights your dentist or eye doctor uses to do an examination
  - halogen lights
  - strong or intense lights such as those used in make-up lights, tanning salons, and neon signs
- If you go out in the daytime, cover every part of your body\*\*. Sunscreen will not help photosensitivity because it protects the skin against ultraviolet light (light you cannot see) but your PDT uses visible light so you must keep your skin covered. If possible, save outdoor activities for dusk or dark. \*\* Hat to shield eyes, face, scalp; gloves to protect hands; dark sunglasses (even if in a vehicle or it's a cloudy day); light color scarf to protect your neck; long sleeve shirt and long pants to protect arms and legs; socks and shoes to protect the feet.
- **Remember when you go for your first treatment that you will have photosensitivity when you leave and go home. Come prepared with whatever you need to cover your entire body.**
- Carry a card or wear a bracelet that identifies you as having photosensitivity.
- Low (ambient) indoor lighting is OK as is the light from a computer screen or TV.
- If you have kidney or liver problems, it may take longer for photosensitivity to go away.
- PDT may cause problems for a fetus. If you are capable of getting pregnant, you must use effective contraception. Talk to your doctor for details.
- Do not breastfeed during treatment and for 5 months after your last dose of the photosensitizer.
- Avoid heating pads and hair dryers that go on/over your head.
- Do not stay completely in the dark. Low levels of indoor light actually helps your skin breakdown the photosensitizer and lessens your photosensitivity. Keep your curtains open on cloudy days until your skin test is negative.

## How do I test my skin?

Four (4) weeks after you have PDT, you can test your skin to find out if you can handle bright light.

1. Cut a 2 inch hole in a paper bag and put the bag over your hand.
2. Make sure the rest of your skin/body is covered.
3. Rest your hand (in the bag) in the sunlight **for no more than 10 minutes. Note: If you notice your skin getting red or it feels uncomfortable - STOP the test and get out of the sunlight. If you don't have any immediate symptoms during the test,** go back inside/out of bright light at the end of the test.
4. Check the skin on your hand to see if you have a reaction. Reactions may include a red mark, blisters, and/or swelling.
5. If you have a reaction, continue the strong precautions and repeat the test after 2 more weeks. Photosensitivity can last as long as 90 days (3 months) after your PDT treatment.
6. If you do not have a reaction to the test, you can **slowly** return to normal outdoor activities but please stay out of the sun during the part of the day when the sun is strongest (10 a.m.-4 p.m.). In addition, when you are returning to being in bright light, avoid exposing your skin to sunlight for a long period of time at once.

## When to call us

Call us right away if you have any signs of a photosensitivity reaction such as swelling, redness, or blistering of your skin.

## Thoracic Center - Important phone numbers

- The Thoracic Clinic is open Monday to Friday, 8:00 a.m. to 5:00 p.m.
- Phone: **716-845-3167**. DO NOT leave a message for anything urgent.
- After hours, weekend, and holidays, call **716-845-2300 or toll free 1-800- ROSWELL (1-800 - 767-9355)** and our Call Center staff will assist you. If you are having urgent but non-life threatening symptoms, we may ask you to come to our Assessment & Treatment Center (ATC) to be seen. The ATC is open 24/7 but you must be referred by your provider or the provider on call; it is not a walk-in clinic.