Respiratory Gating

If radiation therapy is part of your treatment plan, a technique called respiratory gating may be used. Depending on your type of cancer and your treatment facility, there are several types of respiratory gating. In this article, we will discuss why respiratory gating is used and some of the most common techniques and devices. Talk with your radiation oncology team about the specifics of your plan.

What is Respiratory Gating?

Respiratory gating is a breathing technique, using a special monitoring device, used during external radiation therapy. External radiation therapy uses a precise beam of radiation, directed into the body to damage cancer cells (tumor). It is important that the radiation beam targets all or most of the tumor, while sparing as much healthy tissue as possible. “Respiratory gating” is a technique that controls the radiation beam based on your breath.

As you breathe in and out, tumors located in the belly or chest area can shift or move. This movement is normal. Respiratory gating focuses on the tumor’s movement through the breathing process, so that your tumor remains the primary target of radiation.

Respiratory gating is a general term for a device that monitors your breathing and adjusts the radiation beam as necessary during treatment. It is most often used in the treatment of tumors in the chest, abdomen (belly), and breast.

What can I expect?

Most commonly, your care team will decide if respiratory gating is right for you during the planning stages of radiation therapy, also known as “simulation.” During simulation, a CT (cat) scan of the region to be treated is done. Information from the CT scan is used to locate the treatment fields and create a “map” for the radiation team to design the treatment. If the provider notices your tumor moves as you breathe during the CT scan, respiratory gating may be recommended.

Although there are a few ways to do respiratory gating, the goal is the same: to monitor and control your breathing to make the radiation as accurate as possible. Whichever technique is used, you will have a chance to practice and learn more about it before starting treatment. Some examples of respiratory gating include:

- **4D (4-Dimensional) Gating:** You may have a Velcro belt around your waist with a block on it. This tracks the movement of your chest and belly with each breath. The 4D images (taken during simulation) allow your care team to see your tumor’s position during the phases of your breathing. Most 4D gating devices have infrared lights connected to a camera. This tells the radiation beam to go on and off at the correct time.

- **Deep Inspiratory Breath Hold (DIBH):** These devices include the SDX system and ABC (active breathing control). You may be asked to breathe into a mouth piece, which tracks your inhale and exhale. There will be a clip on your nose to prevent air from going in and out of your nose. You might also wear video glasses. These glasses show you a graph, or wave, that links up with your breath. When you breathe in, the line goes up. When you breathe out, the line goes down. Your radiation therapist can also see this wave on their computer. You will be asked to hold your breath during certain points.

- **Abdominal Compression:** A belt with a compression “plate” may be placed around your belly. This puts pressure on your belly and diaphragm (the main muscle used in breathing). This limits the movement of your chest and belly during inhale and exhale, leaving less room for tumor movement.

Regardless of which technique is used at your treatment facility, your care team wants you to be as comfortable as possible. Talk with your provider about your plan and the devices used at your facility.
OncoLink is designed for educational purposes only and is not engaged in rendering medical advice or professional services. The information provided through OncoLink should not be used for diagnosing or treating a health problem or a disease. It is not a substitute for professional care. If you have or suspect you may have a health problem or have questions or concerns about the medication that you have been prescribed, you should consult your health care provider.