



Deep Inspiration Breath Hold (DIBH) for Lung Cancer

What is DIBH?

- Deep Inspiration Breath Hold (DIBH) is a radiation therapy technique for lung cancer treatment that can lower the radiation dose to healthy organs by minimizing internal motion with the use of breath holds.
- During DIBH, the patient is asked to take a deep breath in and hold their breath for about 20 seconds at a time. While in the breath hold position the radiation treatment will be delivered.
- When you take a deep breath and hold it, your lungs and other nearby organs are essentially paused in motion.
- Target motion is typically reduced in this position, and the radiation treatment can be delivered to a smaller volume while still achieving full dose to the target and lowering dose to nearby healthy organs.

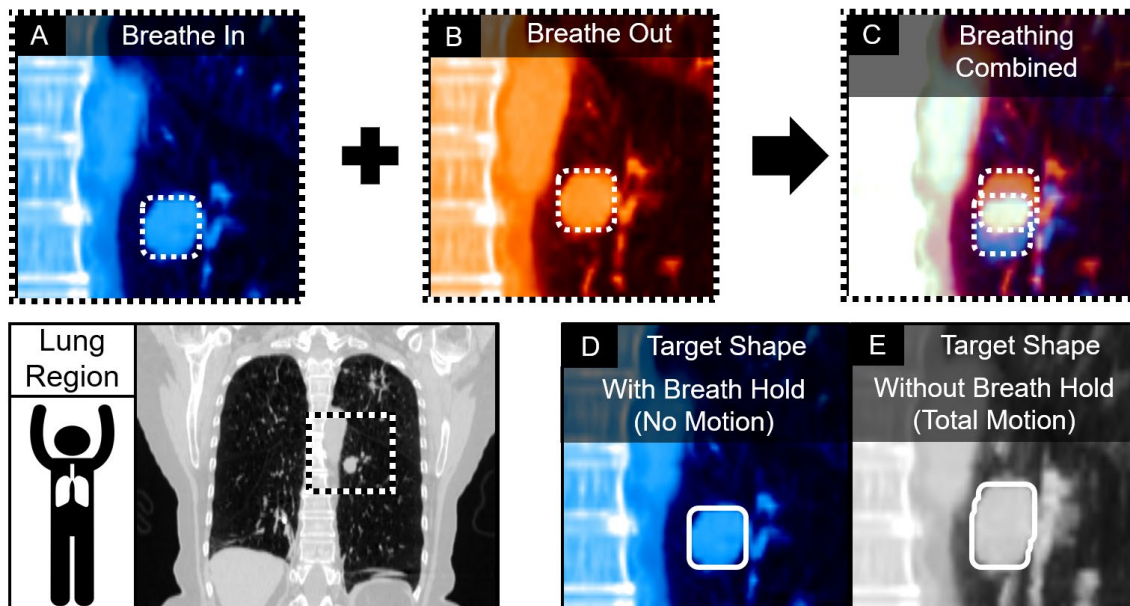


Figure 1. Demonstration of reduced treatment volumes when using DIBH. A) CT image of a lung tumor during breathe in. B) CT image of a lung tumor during breathe out. C) Shows the combined tumor positions of breathe in and breathe out. D) Demonstrates the smaller treatment target achievable using DIBH. E) Demonstrates the larger treatment target needed due to the total tumor motion during normal free breathing.

**NOTE: The example chosen is meant to demonstrate the effectiveness of DIBH for some patients and does not reflect the circumstances for all patients. Be assured that the physicians will assess each patient's needs individually.*



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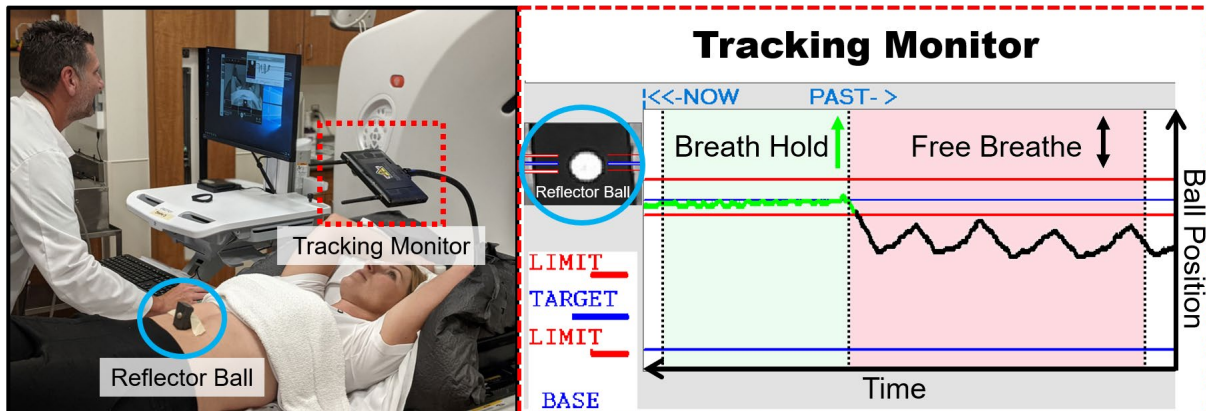


Figure 2. The left image shows a typical patient setup. A “Reflector Ball” is placed on the stomach region (blue circle). A small “Tracking Monitor” screen (red dotted line) is also used so that the patient can watch their position. The Right image shows the tracking monitor display, which is what the patient will see on the screen. The tracking monitor tracks the up and down position of the “Reflector Ball”. As you breathe in-and-out normally (“Free Breathe”), the reflector ball moves up and down (red region in graph). During breath hold, the reflector ball will be held in an up position which will look like a flat constant line on the monitor (green region).

What can I expect?

- It is important that you hold your breath at a comfortable level and position, such that you can reach the same breath hold position each day at treatment.
- When you arrive for your Radiation Treatment Planning scan, the CT Techs will place you into the treatment setup position which also uses a reflector ball and tracking monitor (as shown above).
- The tracking system ensures that you are able to hold your breath for the appropriate time frame, and that you are able to return to the same position after many breath holds (During treatment you may need to repeat the breath hold 10 – 15 times for each fraction).
- The same tracking system and setup position used during your image session will also be used at treatment.
- Only qualified and authorized personnel will be present. Security cameras in the room are only to monitor patient safety during imaging or treatment when personnel cannot be present. Be assured that patient privacy is critically important, and that we strive to create a comfortable and safe environment for your imaging session and treatment.



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How can I prepare / practice?

A Practice Guide for Breath Hold can be found on next page. The included exercises will help you develop better control and endurance for the DIBH technique.

As you practice, aim for these goals:

- Comfortably take 10-15 deep 20 second breaths back-to-back in one session.
Take short 30-45 second breaks between breath holds
- Match your body position with each breath hold.
- Practice makes perfect!

Self-Assessment

During your practice note any difficulties, questions, or concerns and please reach out to your Physician prior to the imaging session. The goal is reproducibility of your body position. You should be able to reproduce your practice technique for treatment with similar results each time.

If you are unable to hold your breath for >15 seconds, please inform your Physician prior to your scheduled imaging session.

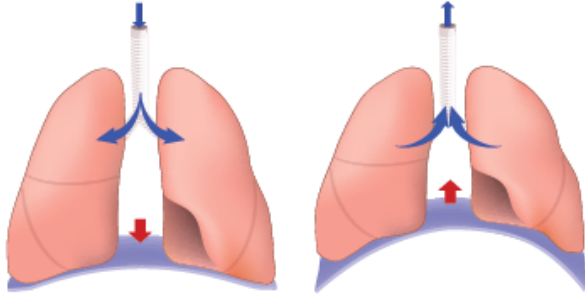
Physician Contact Information

Physician: _____

Clinic Contact Number: _____

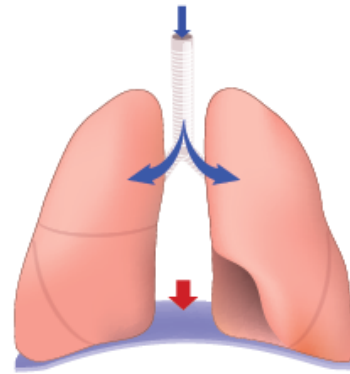


Practice Guide for Breath Hold



Normal Breathing:

Alternating between breathing in and out



Breath Hold:

Breath in deeply and **HOLD**

Final Goal: Comfortably take 10-15 deep breath holds of 20 seconds or more in one session

**Take short 30-45 second breaks between breath holds*

Practice 1 Instructions:

Take 10-15 breath holds per session.
Practice for at least 2 sessions daily:



- Take a seat
- Take a deep breath
- Hold your breath for more than 10 seconds
- Try to increase your breath hold time each day up to 25 seconds

Practice 2 Instructions:

Take 10-15 breath holds per session.
Practice 2 sessions each day
**After waking up, and before sleep*



- Lay down on your back
- Raise your arms above your head
- Take a deep breath
- Hold your breath for more than 10 seconds
- Try to increase your breath hold time each day up to 25 seconds