

IPF and Pulse Oximetry

By Taleena Koch

When you have pulmonary fibrosis, you learn that the amount of oxygen in your blood (your oxygen saturation level) can change depending on how active you are.

First, it's important to know some terms:

- **Ejection fraction**
An ejection fraction (EF) measures how much blood is pumped out of the left ventricle of your heart with every heartbeat. A normal EF is from 50% - 65%
- **Oxygen saturation**
Oxygen saturation measures how much of the total hemoglobin in your blood is saturated (filled) with oxygen, compared to the total amount of hemoglobin (saturated and unsaturated) that's in your blood. A normal oxygen saturation level is from 95% - 100%
- **Pulse oximeter**
A pulse oximeter is a device you can use to measure your oxygen saturation level
- **Pulse oximetry**
Pulse oximetry is a way to measure how much oxygen is in your blood, without a doctor using a needle to remove and test some of your blood

Why is oxygen important?

Every "body" needs a certain amount of oxygen to work properly. When your oxygen saturation is lower than normal, it can affect many different organs and processes in your body.

The most important effects of having a low oxygen saturation level (also called oxygen deprivation) are:

- **Shortness of breath**
Feeling like you're not getting enough air
- **Muscle fatigue**
When muscle fatigue happens, you tire easily. You may feel it's hard to do something as simple as walking across the room
- **Heart problems**
If the amount of oxygen in your blood goes down, your heart rate tends to go up. That's because your heart and lungs work together: When your lungs aren't doing well, your heart has to work harder to keep you going.

Over time, this situation can weaken your heart and cause other problems like a low ejection fraction, high blood pressure, or congestive heart failure (when your heart can't pump well enough to keep blood flowing properly in your body)

- **Pulmonary hypertension (PH)**
Pulmonary hypertension is high blood pressure in the arteries of your lungs. It's an incurable lung disease that's also common in people who have pulmonary fibrosis. Over time, a low oxygen saturation level can lead to PH
- **Brain cell death**
If your oxygen saturation level is too low for too long, it can permanently affect cells in your brain. The two most common brain-related issues are loss of short-term memory and problems with your cognitive ability (for example, being able to learn, make decisions, communicate with other people, and reason). Keeping your oxygen saturation level at 90% or higher may help.

Since a low oxygen saturation level affects your whole body, try not to drop below 90%.

How to make sure saturation isn't falling below 90%

When you're living with pulmonary fibrosis, watching your oxygen saturation level is part of self-care – and pulse oximetry is how you do it.

A finger pulse oximeter is the most common device you can use to measure your oxygen saturation. But for people who have blood circulation problems (for example, someone who has Raynaud's disease), it's hard to get a good reading with an oximeter.

There are other options you might try, though, from earlobe and forehead pulse oximeters, to newer Bluetooth-enabled oximeters for foreheads (these devices work with smartphones). Unfortunately, they're more expensive than regular oximeters.

You can buy a finger pulse oximeter at your local pharmacy or chemist, or through online retailers. They don't have to be expensive. A typical good finger pulse oximeter may cost around \$30 USD. Some are better than others, as they may register your saturation level and heart rate more quickly.

To make sure your oximeter is taking correct readings, bring it with you to your next doctor's appointment, and compare your reading to the device they use. If you find your oximeter's number display is dim or it isn't working well, finger pulse oximeters are battery-powered; you may just need a new battery.

It's important not to get obsessed with your oximeter, though. While it's a good tool to help manage your disease, you don't need to use it all the time.

When and how to measure oxygen saturation

Someone living with pulmonary fibrosis may find their oxygen saturation is higher when they're resting than when they're sleeping or active. "Resting" means doing something like sitting and watching television, or reading a book. "Active" includes anything from upper body movement while you're seated, to walking around, or some other physical action.

Measuring your oxygen saturation while resting is pretty straightforward, but knowing when to measure it when you're active is a bit more complicated. Your oxygen saturation level can go quickly back to normal when you stop being active, so it's important to take the measurement while you're in motion.

Keep this in mind, too: The longer you do an activity, the more your oxygen saturation may continue to fall. For example, someone who tests their levels when they end a three-minute walk might find their saturation has dropped to 93%. However, if they keep walking and test again at six minutes, they may find that it's now fallen to 89%.

When measuring your oxygen saturation, make note of the following:

- The date and time of your measurement
- What type of activity you were doing and how long you'd been doing it by the time you took a reading
- Any symptoms you were feeling during this time. For example, were you short of breath? Did you have chest pain or feel pressure? Did you feel dizzy?

Overnight oximetry test

You should also get your oxygen saturation level measured while you sleep. If you're a pulmonary fibrosis patient who hasn't started using supplemental oxygen yet, ask your doctor to do an overnight oximetry test; it will check your oxygen saturation level while you're asleep.

When you're sleeping, your breathing is more shallow and your saturation level tends to drop. Checking it on your own as soon as you wake up isn't accurate enough: Once you're awake, your oxygen saturation can go quickly back to normal.

Can I tell if my oxygen saturation is low without using an oximeter?

Many patients believe they'll know when their oxygen saturation is low, so they don't think they need to have a pulse oximeter.

Unfortunately, since your brain doesn't work as well when you have low oxygen saturation, it's common for patients not to know it's happening. Their brain may not register that they're short of breath, or that their body is oxygen deprived.

In fact, sometimes their oxygen saturation can drop so low that people get dizzy, stumble and/or fall, or even lose consciousness. For this reason, it's important that they – or loved ones who are with them – always keep a pulse oximeter handy.

Here's an example of what happened to a PF patient

A woman in the Breathe Support group posted video from her smartphone of being out on a jet ski one day. She was using her supplemental oxygen during this activity. During the video, she was describing what she was doing.

Later, when she watched the video of herself, she noticed that she'd been short of breath while talking. Then she realized that her tubing had come unhooked from her oxygen tank. During the activity itself, she hadn't noticed being short of breath. Her brain had never registered that her oxygen saturation level was low. This patient was very lucky, as her levels could have dropped to the point of losing consciousness – while on a jet ski in the water.

There were many times while my mother was living with pulmonary fibrosis that she was in a similar situation. She'd either forget to turn on her oxygen concentrator or portable tank when she was switching oxygen devices, or her tubing would fall off and she wouldn't notice. Those of us around her would realize it, though, because we could tell she was either short of breath while talking, or she'd become disoriented.

After my mother was diagnosed in 2003, we didn't have a pulse oximeter at home for her. When we'd asked her doctor if she needed one, he'd said no. Over the years, though, he's changed his mind. Now he recommends patients have a pulse oximeter of their own as a tool; that way, they can help self-manage their own oxygen saturation level.

(Medically reviewed by Pravin Pant, MSN, NP)