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## How Central Chemoreceptors Can Get “Stuck” in Low CO<sub>2</sub>

### Your Brain Has Built-In CO<sub>2</sub> Sensors

You have special sensors in your brain called central chemoreceptors. These act like thermostats, constantly checking the carbon dioxide (CO<sub>2</sub>) levels in your brain fluids. Why CO<sub>2</sub>? Because it helps keep your body's chemistry in perfect balance.

### What Happens When You Breathe Too Much (Over Time)

If you overbreathe (bring in too much air) – even if you don't notice it – your body gets rid of too much CO<sub>2</sub>. This can happen during:

- Stress or anxiety
- Chronic mouth breathing
- Shallow chest breathing
- Habitual overbreathing patterns

When this happens over weeks, months or years, your brain's CO<sub>2</sub> sensors start to adapt. They get used to the low CO<sub>2</sub> and say: “Oh... I guess this is normal now.” They become less sensitive, and stop sending proper signals to correct the breathing. So the overbreathing continues – and you may feel symptoms like:

- Dizziness or fogginess
- Shortness of breath (even when you're breathing a lot)
- Anxiety or restlessness
- Chest tightness or fatigue

### The Stuck Thermostat

Think of your chemoreceptors like a house thermostat. If the thermostat gets used to the house being too cold, it stops trying to warm it up. That's what happens when your brain gets used to low CO<sub>2</sub> – it stops trying to fix the imbalance.

### But There's Good News – You Can Reset It

Through CO<sub>2</sub> tolerance training you can teach your brain to accept slightly higher CO<sub>2</sub> levels again – which is actually healthier and more balanced. This includes practices like, but not limited to:

- Nasal breathing
- Slowing the breathing rate
- Low air volume inhales (bringing in less air)
- Breathing diaphragmatically with an expansion of the lower ribs
- Breath holds (in a safe, structured way)

Over time, your chemoreceptors relearn what “normal” feels like, and your breathing system becomes more calm, stable, and efficient.

## Visual Guide

Here's a simple diagram that shows the journey

### Before Breath Retraining (Stuck in Low CO<sub>2</sub>)

Overbreathing    Low CO<sub>2</sub>    Brain adapts to low CO<sub>2</sub>    Less signals to slow breathing

Symptoms: Dizziness, anxiety, fatigue, shortness of breath

### During Breath Retraining

Conscious breathing    Slower breath    CO<sub>2</sub> starts to normalize    Brain senses shift

Chemoreceptors begin to "wake up" again

### After Breath Retraining

Healthier CO<sub>2</sub> range    Chemoreceptors more responsive    Breathing feels calmer, clearer, more natural

Symptoms fade, balance returns



Think of your chemoreceptors like a house thermostat