



The Anatomy and Physiology of a Panic Attack

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Taken from the book Overcoming Anxiety and Depression and Breathing Correctly in COPD/Emphysema: A Self Care Book for People with COPD and a Psychosocial Manual for Professionals

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Since many panic attacks occur suddenly, that is without prior warning and without an identifiable cause, you may feel totally at loss in trying to make sense of it. In this section we will discuss how these symptoms are interconnected and the mechanisms that escalate symptoms to a full blown panic attack.

Hopefully, when you understand how a panic attack starts and escalates, you may be able to forestall the onset or modify the intensity of the symptoms and as you acquire further knowledge and skills in this area, you may be able to stop them altogether.

Breath dysregulation may be the major reason for setting off the emergency alarm or, let's say, our "panic button." A panic attack is nothing but the body's emergency

system at work! The emergency system that is swung into action by an alarm (often a false alarm) set off by your brain.

Breathing involves both brain and lungs. You hear a lot about the lungs, airways, air sacs, diaphragm, ribcage etc., in connection with breathing, but you rarely hear about the central and critical role your brain plays in monitoring and regulating breath. Let's call it the "central respiratory control system."

It can't be any other way! Breathing is absolutely essential for our survival, hence it has got to be under the control of the "higher ups," your brain. Your brain is constantly monitoring the oxygen (O₂) and carbon dioxide (CO₂) levels and the ratio between the two.

If the O₂-CO₂ levels and their ratio ever go outside "acceptable range," the brain will give distress signals or set off the emergency alarm. The higher order brain, also called the "thinking brain" or our "mind" may also get involved in modifying or magnifying the problem depending on perception, interpretation and other thoughts related to the breathing episode.

Recurrent panic attacks may be defined as a "dysfunction of the central respiratory control system." That dysfunction may be temporary or permanent. The areas of brain involved in monitoring and protecting the airways from acute respiratory danger (e.g. suffocation) become over sensitized and react inappropriately.

Breathing being a major cause of panic attacks makes it particularly tricky for heart and lung patients. We will discuss that aspect later. For now, let's continue to explore the mechanisms of how the central respiratory control system may begin to overreact and trigger an emergency response even though there may not be a real emergency.

Here are **three popular theories** prevalent in psychological literature regarding panic attacks and central respiratory control dysfunction:

Brain Suffocation Alarm Theory

The brain is constantly reading oxygen and carbon dioxide levels to protect you from suffocation. When O₂- CO₂ levels get to the unacceptable level, the brain sounds the emergency alarm. Emergency operation, that is, the body's fight-flight operation swings into action releasing adrenaline, accelerating heart and lung activity, creating hot flashes, cold chills, and hundreds of other changes that prepare us to fight or flee. That emergency operation, also known as "fight flight" reflex, is what we experience in a "panic attack."

It constantly samples our blood to be sure that we are breathing well and nontoxic air. If there is a problem, our brain alarm wants us to run away from the dangerous situation. With COPD, even small changes in the air such as odors, pollutions, pollens, sudden temperature changes, emotional excitement, acting as if in a hurry

can trigger false suffocation alarms.

Hyperventilation and Hyperinflation Theory

Some people tend to mildly hyperventilate a lot of times. I call it "over breathing." Over breathing can create unacceptable levels of O₂-CO₂ ratio. When O₂- CO₂ levels get to the unacceptable level, the body's emergency system takes over, resulting in a panic attack. Over-breathing causes the lungs to hyper inflate, which means that the lungs are not able to get rid of the excess air they are taking in. Since all the old and stale air doesn't get out of the lungs, there is very little room for the fresh air to get in. In such condition, one tries even harder to take in more air. As a result, a person feels out of breath. They are unable to catch their breath or feel "hungry" for air. Panic sets in.

Catastrophic Theory

Here we rise beyond the territory of the brain and enter the corridors of the mind. Note that thoughts can trigger fight-flight reflex. Theory says that when you think such catastrophic thoughts as, "I may never be able to catch my breath and I'll die" or, "I might be having a heart attack and I might not make it to the hospital," such catastrophic thoughts can signal the brain of an impending danger and set off the body's emergency alarm system.

These theories offer us some insight into how body, breath and mind interact in a "crisis" to trigger a panic attack. However, quite often, the perceived crisis is not always a real crisis, but an exaggerated view of uncomfortable body sensations further confounded by our catastrophic thoughts.

Write which of the above three theories make sense to you or applies in your case.

In light of the above theories, we can now list the various panic attack symptoms in three categories:

- 1)Breath-related discomfort**
- 2)Uncomfortable bodily sensations**
- 3)Catastrophic thoughts**

We will now classify the 13 panic attack symptoms in the above three categories.

Breath-related discomfort

Shortness of breath or smothering

Feeling of choking

Dizziness or lightheadedness or fainting feeling

Uncomfortable bodily sensations

Palpitations, pounding heart, or accelerated heart rate

Chest pain or discomfort

Sweating (not due to heat or exertion)

Trembling or shaking (extremities or the insides)

Numbness or tingling sensations (parts of body or whole body)

Chills or hot flashes (parts of body or whole body)

Nausea or abdominal distress

Feeling of unreality or of detached from self

Catastrophic thoughts

Fear of losing control or going crazy (e.g. "I'm losing my mind!")

Fear of dying (e.g. "I won't make it to the hospital!")

Many cognitive therapists believe panic attacks occur because of our highly exaggerated response to breathing discomfort and unpleasant bodily sensations, and due to the catastrophic thoughts that cross our mind at that time.

What symptoms do you have?

Out of the three "Breath Related Discomforts listed above," which ones do you have?

Out of the eight "Uncomfortable Bodily Sensations," listed above, which ones do you have?

Out of the two "Catastrophic Thoughts," listed above, which ones do you have?
