

What are Panic Attacks?

Understanding the body's "Fight or Flight" response to a threat.

We all have a built-in alarm system that turns on automatically to make sure we survive whatever danger triggers it. This alarm is a lot like a burglar alarm on a house; once it detects something that might be a threat, it automatically sets off several events. If someone were breaking into your house, you would want the alarm system to call the police immediately. You would also likely want to turn on lights and even sound an audible alarm to wake you and scare off the intruder. The brain's alarm system sets off a series of events as well, commonly called the "fight or flight" response.

The fight or flight response is meant to put us in a state of high alert so that we can fight off an enemy or flee to escape with our lives. This alarm makes us faster and stronger and more focused than we would normally be. Our ancestors may not have survived if the human body was not hardwired with the fight or flight response. The reaction is automatic. It helps us survive, and we do not have to think about it; it just happens. But because it is automatic, we do not get to choose which things will set it off.

Sometimes, the fight or flight response can start firing if it thinks there is danger, even when there isn't any real threat around. This is especially common in people who have been through a traumatic event. It's important to know that if this happens, your body isn't out of control, and you're not going crazy. Your body is just reacting to a perceived threat. Your brain is getting your body ready to protect itself, even if there isn't any actual danger. This can result in a *panic attack*.

What are the symptoms of a panic attack?

- Palpitations (skipped heartbeats), pounding heart, or accelerated heart rate.
- Sweating
- Trembling or shaking
- Sensations of shortness of breath or smothering
- Feeling of choking
- Chest pain or discomfort
- Nausea or abdominal distress
- Feeling dizzy, unsteady, lightheaded, or faint
- Derealization (feelings of unreality) or depersonalization (being detached from oneself)
- Fear of losing control or "going crazy"
- Fear of dying
- Paresthesia (numbness or tingling sensation in hands or face)
- Chills or hot flushes

What is the purpose of each physical effect of the Fight or Flight response (panic attack)?

Physical Change:	Why this happens:	What the person may feel:
Faster blood flow	*Fuel and oxygen to body increases *Removes waste faster	* Heart races “out of control”
Heart beats stronger and faster to pump blood through body	*Fuel and oxygen to body increases *Removes waste faster	* Palpitations: Heart feels like it's jumping in chest/skipping beats
Blood rushes to muscles involved in running and fighting	* Muscles can function better * Less bleeding if cut while fighting	* Hands go cold * Skin turns pale (“white as a ghost”) * Numbness and tingling in hands/extremities
Sweating (commonly in armpits, hands, but may be all over)	* Cools the body * Makes you slippery so you can escape if grabbed	* Sweating a lot
Fast and shallow breathing that can trigger hyperventilation (if not actually fighting/fleeing)	* Increases oxygen to blood/body	* Shortness of breath and the urge to breath faster * Dizziness * Numbness/tingling in extremities * Chest pain/tightness in chest * Yawning a lot, even when not tired
Digestion slows or stops	* Focuses all energy on surviving threat (can digest later if it escapes)	* Dry mouth * Nausea/urge to vomit * Constipation (if chronic anxiety)
Pupils dilate (widen)	* Allows more light to reach your eye	* Contributes to dizziness * Blurred vision
Muscles tense up	* Better prepared to move quickly in response to threat	* Tension
Metabolism increases	* Releases more fuel for muscles * Body prepared for increased work	* Flushed with hot and cold flashes * Tired/feeling drained afterwards

When we are startled or perceive something that could be potentially threatening (even if it is not), chemicals are released into the blood stream to give us a “jump start” and prepare us for quick action. For example, if you are in the woods and see a large bear running towards you, the alarm would kick in. Chemicals released in your body would direct your heart to beat faster in order to get more blood to your muscles, the muscles controlling your lungs to breathe faster to increase your oxygen, and your skin to increase sweating. When this process starts, your entire body is affected. The table above outlines some of the physical changes that your body goes through when this reaction is triggered. Each of these changes has some function that helps you survive in dangerous situations.

All of these physical responses are intended to keep us alive in the face of a threat and are supposed to be happening if your mind is registering a threat. Because these responses are important to our survival, they occur quickly and without thought.

If you have a panic attack, and you are not in a situation where you are running for your life, having these reactions can make you feel like you are losing control of your mind and body. This reaction is sometimes made even worse if you begin to hyperventilate.

Hyperventilation

When an individual experiences extreme anxiety, they very often breathe more rapidly as a result of the fight or flight reaction. This allows them to have plenty of oxygen in their bloodstream to take quick physical action (fight or escape). When a panic attack happens, however, we are not always in a position to escape or fight. This is especially true if you are standing still. For example, if you are at work or sitting in traffic when you experience a panic attack, you may breathe more rapidly but not use or “burn off” the extra oxygen that you are taking in. Ironically, this rapid breathing can lead to people feeling like they are not getting enough air. This feeling is called hyperventilation.

When we hyperventilate, our brains are being fooled by a curious physiological effect: the brain tells us we do not have enough oxygen, even though we have plenty. Our bodies naturally maintain a balance between the amount of oxygen and carbon dioxide (CO₂) in the bloodstream. But when a person hyperventilates, they quickly exhale (breath out) a lot of carbon dioxide, shifting the balance.

One important factor in hyperventilation is the pH of our blood. pH is a measure of how acidic or basic a substance is. The pH of our blood helps determine how efficiently oxygen from the red blood cells moves into the rest of the body (organs, muscles, etc.). Exhaling too much carbon dioxide too fast almost immediately raises the pH of our blood, making it more basic and causing the oxygen to become more “sticky” and less able to get to the cells of the body. Since the cells of the body aren’t getting the regular amount of oxygen, they send signals to the brain indicating a lack of oxygen. The brain in turn sends a signal telling us to breathe faster. It becomes a cycle: the faster we breathe, the faster we exhale carbon dioxide, and the faster the pH of our blood increases, triggering faster breathing. This process can help make a panic attack build rapidly.

It’s important to remember that even when someone is hyperventilating, they already have plenty of oxygen in their lungs and bloodstream. The level of oxygen in the blood of someone who is hyperventilating is usually already at 100%. Even if the individual were wearing a medical oxygen mask, they would not be able to increase their oxygen! If you hyperventilate, you may feel like you are suffocating, but you will survive. If you can get yourself to stop hyperventilating, you will feel better right away.

How to stop hyperventilating:

Since this whole process is caused by breathing out too much carbon dioxide and not having the right balance of oxygen and carbon dioxide in the body, anything that raises the carbon dioxide level will normalize the pH of the blood. Normal room air contains about 0.035% carbon dioxide. When a person exhales, the content of carbon dioxide is about 4%, a much higher level. If a person can find a bag and breathe into it for one to two minutes, doing

so can rapidly bring the pH of their blood back to normal. Once the pH shifts back to normal, the body will recognize that it is getting the oxygen it needs, and the person will feel a very rapid wave of relief.