

Breath Work for Brain Change: Five Simple Breathing Techniques for Trauma, and How They Heal the Brain



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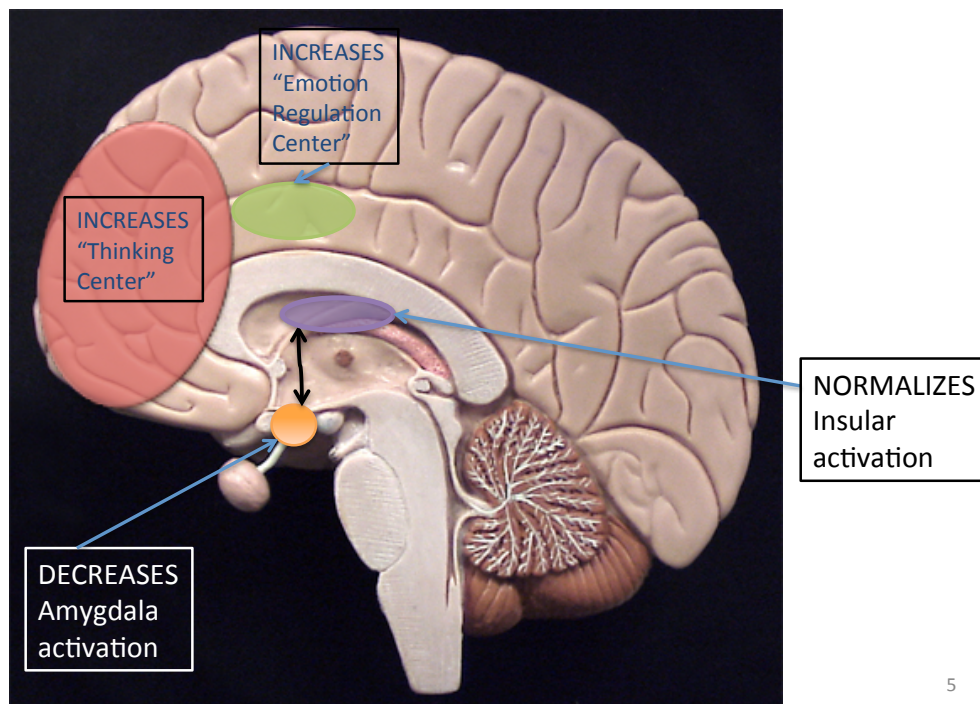
Your Brain on Focused Breathing

Focused breathing techniques change the brain in at least **four** key ways. These brain changes help clients reduce and better manage arousal and reactivity, re-experiencing, and negative alterations in cognition and mood symptoms.

1. Amygdala (“Fear Center”): Decreased activation of the “fear center.” De-activation of this area helps to reduce reactivity when trauma triggers arise. It also reduces the stress response (sympathetic nervous system arousal) and results in a decrease in arousal and reactivity symptoms, such as hypervigilance, feeling on guard, etc.
2. Insula (“Interoception Center”): Reduced insula over-reactivity. In PTSD the insula is often dysregulated. When it is overactivated, there is emotional reactivity and outbursts (emotion undermodulation); when it is underactivated, there is dissociation and numbing. Both of these extremes are common in PTSD. With a more regulated insula, individuals improve interoception, and they experience fewer emotional outbursts and dissociative symptoms (including numbing).
3. Prefrontal Cortex (“Thinking Center”): Increased activation of the “thinking center” of the brain, including areas involved in attention and concentration, self-awareness (ventromedial prefrontal cortex) and awareness of others (dorsolateral prefrontal cortex).
4. Cingulate (“Self-Regulation Center”): Increased activation of the “self-regulation center” of the brain, which is involved thought and emotion regulation and decision-making.

Handout: Your Brain on Focused Breathing

Your Brain On Focused Breathing



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Focused Breathing techniques change the brain in **four** ways:

1. Less activation in "Fear Center" of the brain:
 - Reduces how strongly you react to trauma triggers
 - Reduces the stress response and increases the relaxation response
 - Decreases hypervigilance and the feeling of "always being on guard."
2. Less over-reactivity of the "Interoception Center" of the brain:
 - Reduces how strongly you react to trauma triggers
 - Reduces anger and other emotional outbursts
 - Reduces dissociation
 - Reduces numbing
3. Increased activation of the Prefrontal Cortex ("Thinking Center"):
 - Improves concentration and attention
 - Improves self-awareness
 - Improves social awareness and "social intelligence"
4. Increased activation of the Cingulate ("Self-Regulation Center"):

- Improves emotion regulation and self-regulation
- Improves decision-making

Breathing Technique 1: Diaphragmatic Breathing

Symptoms Addressed

Improved emotional awareness and regulation
Improved concentration and attention
Regulated interoception
Reduced “stress response” and increased “relaxation response”
Reduced DSM-5 PTSD Arousal and Reactivity symptoms

Diaphragmatic Breathing Explained:

Diaphragmatic breathing, or abdominal breathing, is a type of deep breathing believed to be a healthy alternative to the shallow, chest breathing commonly associated with anxiety and panic. In diaphragmatic breathing, an individual breathes through their diaphragm, a muscle located between the chest and abdominal cavities, below the rib cage and above the belly button. Diaphragmatic breathing is a widely supported anxiety and stress management technique that is believed to induce a state of relaxation and reduce autonomic system arousal.

Diaphragmatic Breathing Tips:

- Be sure to breathe through the diaphragm, as opposed to engaging in shallow chest breathing.
- If possible, complete this exercise sitting in a chair or lying down.
- If you feel comfortable with closing your eyes during this practice, this is recommended. If not, find a place on the floor to gently focus your eyes on.
- It is recommended that this technique be practiced for approximately 5 minutes, multiple times per day.

Key Research Findings:

- Reduced stress and anxiety (Fried, 1993; Rowe, 1999; Wehrenberg, 2008)
- Increased quality of life (Fred, 2000; Hagman et al., 2011)
- Reduced blood pressure and improved self-regulation (Russell, 2014)
- Reduced inflammation (Rosas-Ballina, 2011)

Handout: Diaphragmatic Breathing

Strike a Pose

To ensure you are breathing through the diaphragm, thereby activating the vagus nerve (which then stimulates the relaxation response in the body and the brain), consider assuming of these poses:

1. **Lay-Z-Boy Pose:** Sitting or lying down, place your hands behind your head, elbows facing out. If you are sitting in a chair, lean back slightly, expanding your rib cage a bit. Now begin taking long, deep, full breaths. As you do this you will notice your rib cage expanding with each inhale.
2. **Totem Pole Pose:** Sitting upright in a chair, straighten your back and bring your shoulders down and back. Now place your hands under your thighs so that you are sitting on your hands. In this position begin taking long, deep, full breaths. As you do this you will notice that it is difficult to move your chest, and the breath will feel as though you're blowing up a balloon in your lower stomach area.
3. **Hands On Pose:** Sitting upright in a chair or laying down, place your left hand on your chest and your right hand on your stomach, just above your belly button. Begin taking long, deep, slow breaths in and out. As you breathe deeply, intentionally try to breathe in a way such that your left hand remains still, and your right hand moves upward/outward with each inhale, and downward/inward with each exhale. When you see your right hand moving more than your left, it is a good indication that you are breathing through your diaphragm.

Instructions

Sit or lie in a comfortable position.

Assume one of the above poses to ensure you are breathing through your diaphragm.

Begin to inhale slowly through your nose, allowing your diaphragm to fill with air.

As you exhale, breathe through your nose, and allow the air to exit your diaphragm slowly. If possible, elongate the exhale so that it is longer than your inhale.

Noticing what it feels like in your body to breathe, continue diaphragmatic breathing for approximately five minutes.

To end this practice, release your hands down to your side and take two deep, diaphragmatic breaths.

Breathing Technique 2: The Five-Count Breath

Symptoms Addressed

Improved emotional awareness and regulation
Improved concentration and attention
Regulated interoception
Reduced intrusive memories
Reduced “stress response” and increased “relaxation response”
Reduced DSM-5 PTSD Arousal and Reactivity symptoms

Five-Count Breath Explained:

The Five-Count Breath is a focused breathing technique in which you direct your attention to the breath, counting to five as you inhale, then holding the breath for five counts, and then exhaling for five counts. As you engage in this sequence, you concurrently visualize these counts as forming the outline of an upside-down triangle, such that on the inhale you visualize a line moving upward and to the left, then as you hold the breath you visualize a line going straight across from left to right, and then on the exhale you visualize the line moving down and to the left, creating a point with where the line first began. This sequence is repeated for several minutes. The Five-Count Breath should be practiced in conjunction with diaphragmatic breathing.

Five-Count Breath Tips:

- Be sure to breathe through the diaphragm, as opposed to engaging in shallow chest breathing.
- If possible, complete this exercise sitting in a chair or lying down.
- If you feel comfortable with closing your eyes during this practice, this is recommended. If not, find a place on the floor to gently focus your eyes on.
- It is recommended that this technique be practiced for approximately 5 minutes, multiple times per day.

Key Research Findings:

- Reduced stress and anxiety (Fried, 1993; Rowe, 1999; Wehrenberg, 2008)
- Increased quality of life (Fred, 2000; Hagman et al., 2011)
- Reduced blood pressure and improved self-regulation (Russell, 2014)
- Reduced inflammation (Rosas-Ballina, 2011)
- May reduce intrusive memories (Kemps, Tiggemann, & Christianson, 2008)

Handout: The Five-Count Breath

Sit or lie in a comfortable position.

Begin to practice diaphragmatic breathing, focusing first on the sensations of the breath.

To begin the Five-Count Breath, inhale slowly and fully for a count of five.

Next, hold your breath for a count of five, counting at the same pace.

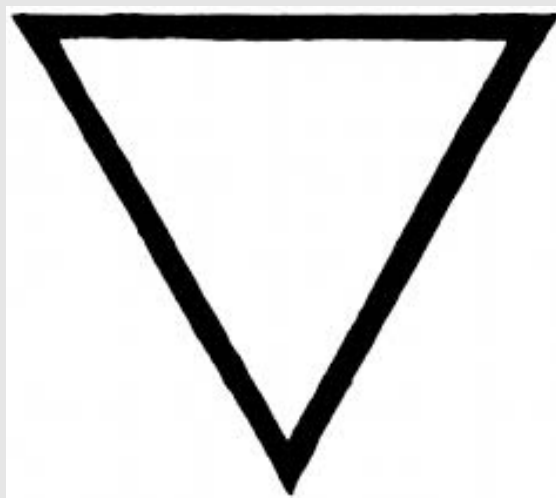
Finally, begin to exhale slowly and fully for a count of five.

Now, as you continue this sequence, begin to concurrently visualize these counts as forming the outline of an upside-down triangle (see below image).

On each inhale visualize a line moving upward and to the left.

When you hold the breath visualize a line going straight across from left to right.

As you exhale visualize the line moving down and to the left, creating a point with where the line first began.



Repeat this sequence for approximately five minutes, bringing your mind back to the counts when it wanders.

Breathing Technique 3: Balanced Brain Breath

Symptoms Addressed

Improved emotional awareness and regulation
 Improved concentration and attention
 Regulated interoception
 Reduced “stress response” and increased “relaxation response”
 Reduced DSM-5 PTSD Arousal and Reactivity symptoms

Balanced Brain Breath Explained:

At any given time, one of your nostrils is more constricted than the other. In other words, there is always one nostril that is a bit more “stuffy” than the other (more open) one. Throughout the day, each nostril takes turns being open or stuffy, and this is related to brain activity. When the left nostril is open and dominant, for instance, the opposite (right) hemisphere of the brain is more active, and vice versa. In order to balance activation of the two hemispheres of the brain, we can purposefully alternate breathing through each nostril, thereby activating each hemisphere and alternating dominance of hemispheric activity.

Balanced Brain Breath Tips:

- Be sure to breathe through the diaphragm as you engage in Balanced Brain Breath, as opposed to engaging in shallow chest breathing.
- If possible, complete this exercise sitting in a chair or lying down.
- If you feel comfortable with closing your eyes during this practice, this is recommended. If not, find a place on the floor to gently focus your eyes on.
- It is recommended that this technique be practiced for approximately 5 minutes, multiple times per day.

Key Research Findings:

- Increased parasympathetic nervous system activation (“relaxation response”; Upadhyay et al., 2008)
- Improved balance between the two hemispheres of the brain (Stancak & Kuna, 1994)
- Improves concentration (Telles, Singh, & Puthige, 2013)
- Reduced inflammation (Rosas-Ballina, 2011)

Handout: Balanced Brain Breath

Sit in a comfortable position.

Begin to practice diaphragmatic breathing, focusing first on the sensations of the breath.

Next, begin to engage in the Five-Count Breath, slowing inhaling, holding, and exhaling for counts of five. Repeat this sequence for a couple of breaths.

To begin Balanced Brain Breath, bring your right hand up to your face after inhaling, as you hold the breath for five counts. While holding the breath, press gently on your right nostril with your right thumb, gently closing off the nostril.

Now exhale slowly and fully for a count of five, exhaling only through the left nostril.

Continuing to close off your right nostril, begin to inhale through your left nostril for a count of five. At the end of the inhale, hold your breath for a count of five just as before.

As you hold your breath, release your right nostril by removing your thumb, and now begin to compress your left nostril with your right ring finger, closing it off. Exhale through the right nostril for a count of five.

Continuing to close off your left nostril, begin to inhale through your right nostril for a count of five. At the end of the inhale, hold your breath for a count of five just as before.

Once again, as you hold your breath, alternate nostril constriction, now pressing on the left nostril again and repeating the sequence described above.

Repeat this sequence for approximately five minutes, bringing your mind back to the counts when it wanders.

Breathing Technique 4: 5-5-8-2 Breath

Symptoms Addressed

Improved emotional awareness and regulation
 Improved concentration and attention
 Regulated interoception
 Reduced “stress response” and increased “relaxation response”
 Reduced DSM-5 PTSD Arousal and Reactivity symptoms

5-5-8-2 Breath Explained:

The 5-5-8-2 Breath is a focused breathing technique in which you direct your attention to the breath, counting to five as you inhale, then holding the breath for five counts, and then exhaling for eight counts, and then holding for another two counts. This sequence is repeated for several minutes. The 5-5-8-2 Breath is similar to the Five-Count breath, except with an elongation of exhalation and a brief holding of the breath after exhalation.

Extended exhalations are often preferable, as they emphasize longer parasympathetic (“relaxation response”) activation. During inhalation the sympathetic nervous system becomes slightly activated; During exhalation the parasympathetic nervous system become slightly activated, which is why longer exhales are encouraged in diaphragmatic breathing techniques.

5-5-8-2 Breath Tips:

- Be sure to breathe through the diaphragm, as opposed to engaging in shallow chest breathing.
- If possible, complete this exercise sitting in a chair or lying down.
- If you feel comfortable with closing your eyes during this practice, this is recommended. If not, find a place on the floor to gently focus your eyes on.
- It is recommended that this technique be practiced for approximately 5 minutes, multiple times per day.

Key Research Findings:

- Reduced stress and anxiety (Fried, 1993; Rowe, 1999; Wehrenberg, 2008)
- Increased quality of life (Fred, 2000; Hagman et al., 2011)
- Reduced blood pressure and improved self-regulation (Russell, 2014)
- Reduced inflammation (Rosas-Ballina, 2011)

Handout: 5-5-8-2 Breath

Sit or lie in a comfortable position.

Begin to practice diaphragmatic breathing, focusing first on the sensations of the breath.

To begin the 5-5-8-2 Breath, inhale slowly and fully for a count of five.

Next, hold your breath for a count of five, counting at the same pace.

Finally, begin to exhale slowly and fully for a count of eight.

Finally, hold the breath briefly, for a count of two.

Repeat this sequence for approximately five minutes, bringing your mind back to the counts when it wanders.

Breathing Technique 5: Body Breath

Symptoms Addressed

Improved emotional awareness and regulation
 Improved concentration and attention
 Improved interoception
 Reduced intrusive memories
 Reduced “stress response” and increased “relaxation response”
 Reduced DSM-5 PTSD Arousal and Reactivity symptoms

Body Breath Explained:

This technique combines several elements which, together, can address multiple trauma symptoms. First, Body Breath incorporates interoceptive training, helping the individual become more aware of their internal states through “feeling into” the heart and other areas of the body. Second, this diaphragmatic breathing exercise includes visual imagery, which activates the right hemisphere of the brain. This is important, as it is common for traumatized individuals to show right hemisphere *underactivation* (and as a result may lose their sense of creativity, experience spiritual crisis, and feel overwhelmed by intrusive thoughts produced by the left hemisphere). Finally, this breathing technique includes a positive emotion induction (love), which aims to reduce feelings of fear associated with the activation of the amygdala (“fear brain”).

Body Breath Tips:

- Be sure to breathe through the diaphragm as you engage in Body Breath, as opposed to engaging in shallow chest breathing.
- If possible, complete this exercise sitting in a chair or lying down.
- If you feel comfortable with closing your eyes during this practice, this is recommended. If not, find a place on the floor to gently focus your eyes on.
- It is recommended that this technique be practiced for approximately 5-15 per day.
- During the emotion induction portion of this exercise, in which you choose a person or pet to bring to mind, try to focus on a person or pet that elicits simple and pure feelings of love. Try to refrain from choosing a person, for instance, who elicits mixed feelings, such as love and anger.

Key Research Findings:

- Reduced stress and anxiety (Fried, 1993; Rowe, 1999; Wehrenberg, 2008)
- Increased quality of life (Fred, 2000; Hagman et al., 2011)
- Reduced blood pressure and improved self-regulation (Russell, 2014)
- Reduced inflammation (Rosas-Ballina, 2011)
- May reduce intrusive memories (Kemps, Tiggemann, & Christianson, 2008)

Handout: Body Breath

Begin to close your eyes and draw your attention to the breath, beginning to breathe through the diaphragm. Now bring an image of your heart into your mind's eye. Visualize your heart as if it is in your chest, and feel into this area of the body.

Develop a clear vision of what your heart looks like, and try to focus on it, noticing its size, shape, color, and texture. In this exercise your heart, and other areas of the body, can look any way you wish. It does not have to appear "realistic."

Now, still visualizing your heart, begin to imagine that the air you are breathing is flowing through the heart, such that when you inhale, it flows through the heart in one direction, and as you exhale, it flows back through the heart in the other direction. The color of the breath may be white, or any other color you prefer.

Continue breathing, fully in and fully out, taking long, deep breaths, and as you do this keep the vision of your heart in your mind, watching the breath flow through the heart with each inhale and exhale.

As you continue to breathe through the heart, bring into your mind a thought of a person, or a pet, that elicits strong feelings of love. Identify this person or animal by name in your mind, connect with them mentally, and allow yourself to feel the love you have for them. Connect with that love.

Staying connected to that love, gently let go of the thought of that special person or animal, holding on to the love you feel for them. Imagine this love is a color, perhaps purple, or any color that feels right.

Imagine this love is flowing through the heart along with the breath. As you breathe through the heart, the love flows through the heart along with the breath. Visualize both colors flowing up through the heart with each inhale, and back down through the heart with each exhale. Continue breathing love and breath through your heart for a few moments, continuing to visualize your heart, breath, and emotion.

Next, begin to shift your focus away from your heart and on to your brain, visualizing your brain inside of your head and feeling into this area of the body. Imagine that you are breathing the love and air through the brain, once again watching the colors flow up through the brain with each inhale, and back down the brain with each exhale. Continue this visualization for several breaths.

Finally, shift your attention to your stomach, visualizing your stomach inside of your abdomen area and feeling into this area of the body. Imagine that you are breathing the love and air through the stomach, watching the colors flow up through the stomach with each inhale, and back down the stomach with each exhale. Continue this visualization for several breaths.