

Yoga Therapy for Depression

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Hot Yoga Wellness

Abstract

Mental health and well being is an important component of our overall health. In fact, mental and physical health is intimately connected through a variety of bidirectional mechanisms. Research evidence suggests that by supporting the mental health of our client will help to:

- Reduce risk behaviors (e.g. tobacco, alcohol, and drug misuse)
- Reduce severity of physical illness
- Improve recovery rates
- Improve physical health outcomes (www.bcmhsus.ca, 2013)

This study explores to understand the biochemical process in general depression and applying yoga in itself as a therapy to manage the symptoms through understanding the strong connection between mind, body and breathe. Yoga Therapy is not a one size fit all solution, as each individual reacts differently, though situation is the same.

Yoga Therapy for Depression

Depression is about feeling of sadness for extensive period of time though everything in your life is going right (TedX, 2013). Prolonged feeling of sadness can turn into an illness that causes brain damage. It is an inability to experience love; pleasure and also inability to enjoy work or play in a daily life. Sometimes, instead of sadness, a depressed person will experience a general sense of emotional numbness, an inability to feel anything or unable to express anything. The person may become short-tempered when they are depressed. They may be more irritable, snapping at coworkers or clients, which may lead to new stresses and conflicts. Feeling stress and anxiety (physical tension and worry) can also accompany depressed mood.

It is very complex to understand and it is more than just too much or too little of brain chemicals. There are many possible causes of depression and play significant role in the development of depression.

Depression involves all areas of your life like; life situation, thoughts, emotions physical state, and actions. These areas are all connected to each other. As a result, changes in one area can have impact on the other. (www.comh.ca, 2007)

Depression can affect biologically, psychologically, behaviorally, culturally, and socially. It can be coming from endogenous or exogenous factors, however **the most common thing in all is, it is brain's runaway stress response.** (PhD, 2013)

Therefore, the goal is to get all areas of your life spiraling upward, each producing positive change. In order to produce a positive change, one has to understand the process in itself and understanding the emotional response to any change. It is not easy; however it is not impossible if we break down the task into SMART goals.

SMART stands for specific, measurable, achievable, realistic, and timely.

The Biological Process:

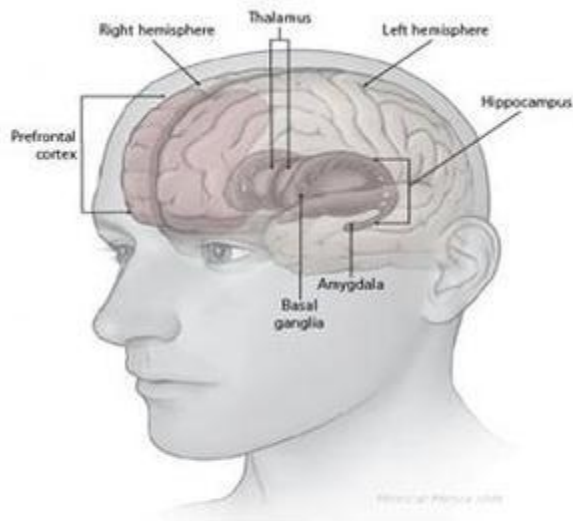
Depression begins with stress, and it involves change in the area of a brain that controls mood. The nerve cells may be functioning poorly in that area of the brain to cause a mood swings. The severity of the condition also depends on how fast the new neurons cells are generating (growing) and the steady communication between neurons. It is also affected by the quantity and quantity of hormones released in the brain.

It makes it even complicated when an individual's life experience affects these biological processes and genetic makeup influences makes the individual vulnerable to breakdowns in these functions. In many cases it appears that there is no single cause general depression. (mind and mood, major depression, 2014)

To understand the biological process from stress to depression, we will have to understand little bit about the limbic system, the area of the brain which is responsible for our emotional response.

The limbic System

Our limbic system is a structure located deep within the brain, which is the emotional part of our brain. Some parts of our limbic system regulate autonomic and endocrine function, especially in response of emotional situation. Additionally, it processes sense of smell; stores highly charged emotional memories, affects our sleep, appetite cycles, moods, sexuality and bonding. (Hampton)



The regions shown here are mirrored in both hemispheres of the brain. Also, these structures are interlocking; the illustration suggests location and relative region but not precise location.

What is depression 2009

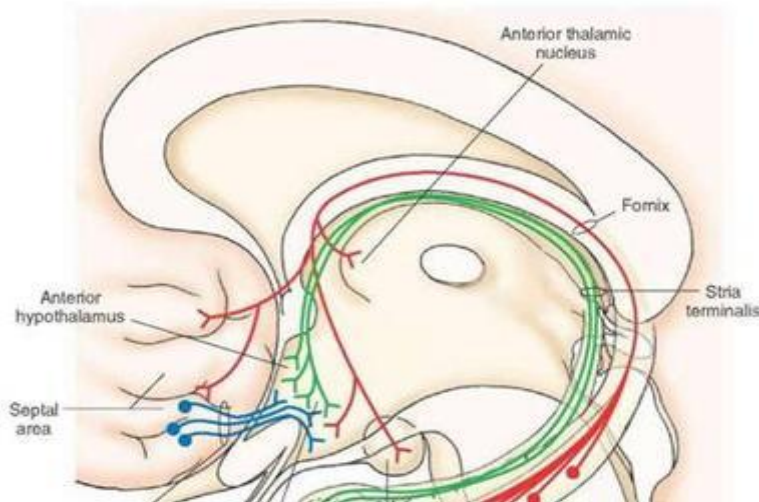
Thalamus: The thalamus relays sensory impulses from receptors in various parts of the body to the cerebral cortex. A sensory impulse travels from the body surface towards the thalamus, which receives it as a sensation. This sensation is then passed onto the cerebral cortex for interpretation as touch, pain or temperature. The thalamus is crucial for perception, with 98% of all sensory input being relayed by it. The only sensory information that is not relayed by the thalamus into the cerebral cortex is information related to smell (olfaction). (Robertson, 2016)

Hypothalamus: It is connected with the frontal lobes, septal nuclei and the brain stem reticular formation (a diffuse network of nerve pathways in the brainstem connecting the spinal cord, cerebrum, and cerebellum, and mediating the overall level of consciousness) via the medial forebrain bundle (MFB). The MFB is a part of the reward system, involved in the integration of reward and pleasure. The MFB passes through the lateral hypothalamus and the basal forebrain in a rostral-caudal direction. It contains both ascending and descending fibers. It also represents a part of the mesolimbic pathway, carrying information between the ventral tegmentum and the nucleus accumbens. (Hernandez G, 2006)

The hypothalamus receives inputs from the hippocampus via the fornix (The fornix (Latin: arch) is a C-shaped bundle of nerve fibers in the brain that carries signals from the hippocampus to the mammillary bodies and then to the anterior nuclei of thalamus) and the amygdala. The hypothalamus has centers involved in sexual function, endocrine function, behavioral function and autonomic control. It strongly influences many functions including autonomies, endocrine and behaviors.

Amygdala: It is a centre for coordinating behavioral, autonomic and endocrine responses to environmental stimuli, especially those with emotional content. It is essential, allows us to feel certain emotions and perceive them in other people as well. The amygdala is activated when a person recalls emotionally charged memories, such as a frightening situation. Activity in the amygdala is higher when a person is sad or clinically depressed. (Dubuc, 2002)

Hippocampus: The hippocampus has several functions. It helps control corticosteroid production (a class of steroid hormone), it has significant contribution to understanding spatial relations within the environment, and it also critically involved in many declarative memory functions especially in explicit memory, short term memory and long term memory. Lesions of the hippocampus does not affect old, established memories, however it affect new declarative learning. An individual's life experiences affect this biological process and therefore memory plays an important role in depression.



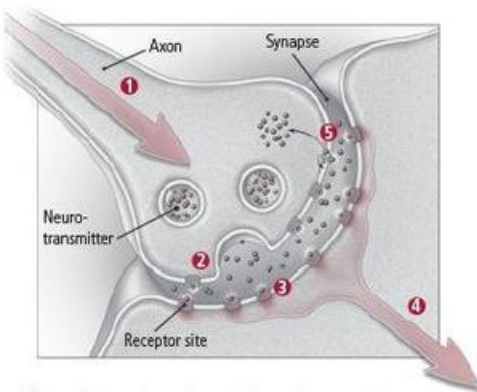
As mentioned earlier, depression is a condition which is very complex to understand and our emotional responses are dependent on endogenous and exogenous factors. Endogenous depression occurs without the presence of stress or trauma. It may be caused by genetic or biological factors and those factors can be imbalance of hormones and neurotransmitters working inside and outside of nerve cells (chemical imbalance). There are millions, even billions, of chemical reactions that make up the dynamic system that is responsible for your mood, perceptions, and how you experience life.

Kinds of neurotransmitters (endogenous factors) which believed to play a role in depression are:

- Acetylcholine enhances memory and is involved in learning and recall.
- Serotonin helps regulate sleep, appetite, and mood and inhibits pain. Research supports the idea that some depressed people have reduced serotonin transmission. Low levels of a serotonin by-product have been linked to a higher risk for suicide.
- Norepinephrine constricts blood vessels, raising blood pressure. It may trigger anxiety and be involved in some types of depression. It also seems to help determine motivation and reward.
- Dopamine is essential to movement. It also influences motivation and plays a role in how a person perceives reality.
- Gamma-aminobutyric acid (GABA) is an amino acid that researchers believe acts as an inhibitory neurotransmitter. It is thought to help quell anxiety.

Let's look at briefly how our neurotransmitters communicate:

- An electrical signal travels down the axon.
- Chemical neurotransmitter molecules are released.
- The neurotransmitter molecules bind to receptor sites.
- The signal is picked up by the second neuron and is either passed along or halted.
- The signal is also picked up by the first neuron, causing reuptake, the process by which the cell that released the neurotransmitter takes back some of the remaining molecules. (Harvard health publication, What causes depression?, 2009)



It begins with stress, as it reduces the production of new neurons (nerve cells) in the hippocampus. Stress elevates the cortisol level and brings the change in the physiological functions. Thalamus is the gateway of sensory stimuli entering and exiting the body, releases the CRH (corticotrophin hormone) in response to psychological stress by cortical brain.

CRH is the central driver of the stress hormone system, known as the hypothalamic-pituitary-adrenal axis (HPA). Corticotrophin-releasing hormone is given this name because it causes release of adrenocorticotrophic hormone from the pituitary gland (ACTH). Adrenocorticotrophic hormone in turn travels in the bloodstream to the adrenal glands where it causes the secretion of the stress hormone cortisol. (society for endocrinology, 2013)

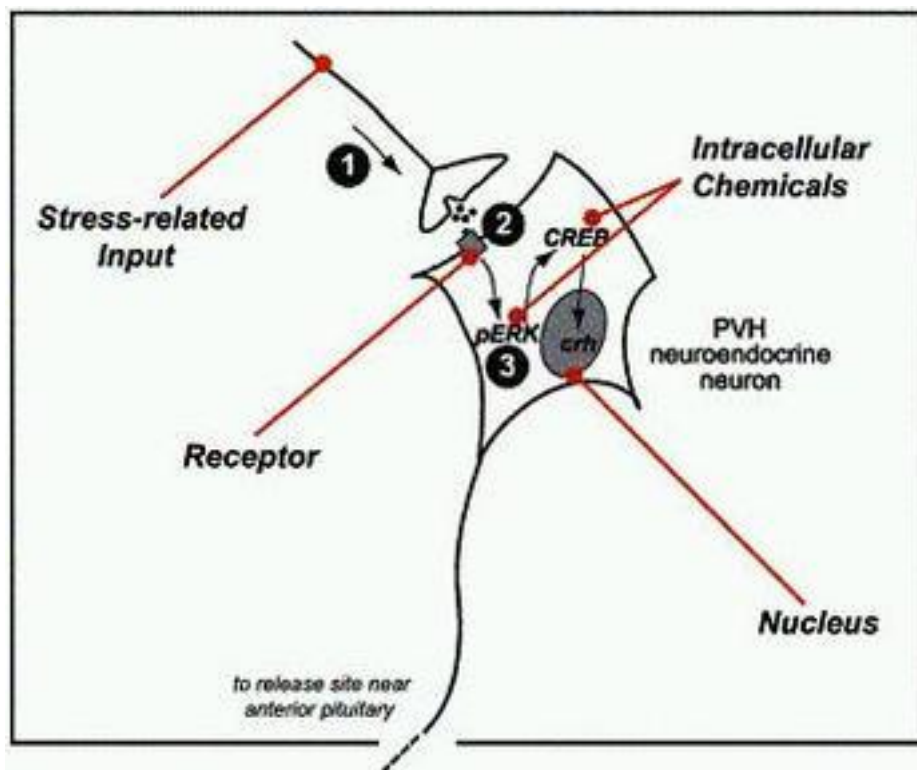


Figure 1. Activation of the CRH gene in the nucleus of a CRH neuroendocrine neuron in response to stress.

Abnormally high CRH levels are connected with a variety of diseases. It stimulates anxiety and suppresses appetite; too much corticotrophin-releasing hormone is suspected of causing nervous problems such as clinical depression, anxiety, and sleep disturbances. All this is to preserve the energy to fight with physical danger or mental stress. This is body's temporary response to stress. If High level of CRH for over the long period can have negative effect on body

It is a sympathetic activation but parasympathetic dominance, where high level of cortisol inhibits further release of ACTH from the pituitary, where ACTH helps to increase the chemical compound that triggers and increase in epinephrine and norepinephrine. As a result level of epinephrine and norepinephrine in the brain is depressed due to inactivity of adrenal medulla. Hormonal system is under stress and sympathetic nervous system is inactive which result in insufficient amount of catecholamine is produced, which is primary job is to survival during challenging time.

Understanding depression at the neurological level:

As we know now that our Limbic System of the brain is activated during depression. Any activity in the above three areas can affect how neurotransmitter can function and that can affect the mood.

Neurotransmitters are special chemicals, transfer message throughout the structure of the brain and deeply involved in how nerve cells communicate with one another. Neuron transmit message from nerve cell to nerve cell and they move quickly and therefore our brain can react to the pain instantaneously. Whenever we do anything, react, feel emotions, think, our neurons transmit messages in the form of electrical impulses from one cell to another. An electrical impulse that is picked up by one of the dendrites of the neuron moves through the cell body and then travels down the axon. When it reaches the axon the electrical impulse is changed to a chemical impulse. (Dr.P)

Every cell in our body has the capacity to send and receive signals; neurons are specially designed for this function. Each neuron has a cell body containing the structures that any cell needs to thrive. Stretching out from the cell body are short, branchlike fibers called dendrites and one longer, more prominent fiber called the axon. The release of a neurotransmitter from one neuron can activate or inhibit a second neuron. If the signal is activating, or excitatory, the message continues to pass farther along that particular neural pathway. If it is inhibitory, the signal will be suppressed. The neurotransmitter also affects the neuron that released it. Once the first neuron has released a certain amount of the chemical, a feedback mechanism (controlled by that neuron's receptors) instructs the neuron to stop pumping out the neurotransmitter and start bringing it back into the cell. This process is called reabsorption or reuptake. Enzymes break down the remaining neurotransmitter molecules into smaller particles.

People who are severely depressed or manic, the complex systems that accomplish this go awry. For example, receptors may be oversensitive or insensitive to a specific neurotransmitter, causing their response to its release to be excessive or inadequate. Or a message might be weakened if the originating cell pumps out too little of a neurotransmitter or if an overly efficient reuptake mops up too much before the molecules have the chance to bind to the receptors on other neurons. Any of these system faults could significantly affect mood.

The amygdala, the thalamus and the hippocampus are activated. Activity in the amygdala is higher when a person is sad or clinically depressed. The thalamus receives most sensory information and relays it to the appropriate part of the cerebral cortex, which directs high-level functions such as speech, behavioral reactions, movement, thinking, and learning. According to some research problems in the thalamus, this helps to link sensory input to pleasant and unpleasant feelings. The hippocampus is smaller in some depressed people, and research suggests that ongoing exposure to stress hormone impairs the growth of nerve cells in this part of the brain. (What causes depression, 2009)

In addition to this up to certain level genes, temperament, stressful life event, stress, and trauma plays role leading person to a depression. (What causes depression, 2009)

It is a very complex process to understand where an endogenous and exogenous factor plays a significant role. At times it is not by choice; however it is manageable through tools or techniques, which requires discipline, patience and wanting to make a difference to take a charge of the condition.

Intervention through Yoga Therapy and Yoga practices:

"The evidence is showing that yoga really helps change people at every level," says Stanford University health psychologist and yoga instructor Kelly McGonigal, PhD.

Body-oriented techniques such as yoga help them increase awareness of sensations in the body; stay more focused on the present moment and hopefully empowers them to take effective actions. (Novotney, 2009)

Yoga Therapy or yoga practice offers more than knowledge about asana (postures). Asana is the third in line of Ashtanga Yoga (8 limbs).

The first one is Yama, which deals with deals with one's ethical standards and sense of integrity, focusing on our behavior and how we conduct ourselves in life. It is our External discipline, and developing positive traits.

The second one is Niyama, which has to do with self-discipline, internal and external purification. It is about taking care of our body and mind with love, kindness and self reflection.

From the research we can say that depression is predominantly parasympathetic dominance and therefore stimulating the sympathetic nervous system can be very helpful. It is always recommended to practice under supervision. The following practice can help to stimulate sympathetic nervous system:

- Encouraging Strong inhalations
- Back bending poses allow to open heart, feeling openness which reflects the degree of intellectual curiosity, and preference for novelty.
- Chest opening Yogasana is known to be energizing, warming and leading to increased circulation and increases the heart rate, which stimulates the sympathetic nervous system. Opening chest also reveals buried emotions and fears.
- Beck bending poses allows opening abdomen and sacral area, where we generally hold our past, emotions and hidden fear, breathing deeply into this region will oxygenate the body to stimulate the sympathetic nervous system as long as yoga practice is not seen as a threat. Attitude towards the practice is a key to the wellness, since mind is the seat of all.

Always honor the physical limitations by using required props while practicing. Please follow the following guideline before starting any Asana practice:

- Keep the spine straight during the practice allows the breath to flow without restriction. Making sure the feels at ease while keeping the spine straight.
- Always breathe without any force and observe inhalation and exhalation. Please allow your mind to notice the patterns of breathing and micro movements in your body. It will establish the connection between mind, body and breath.
- Begin asana, the physical part of the practice starting from centering in an easy comfort pose. While keeping the spine elongated, observe the posture and breathe. Start warming up the spine through flexion and extension and then move on to neck rolls. Please let your body settle down and move with your breathe. Please lift your arms with in breath and drop with your out breath. Once settle down, sit quietly to observe the mind and then begin with three parts yogic breathe to bring energy and increase the circulation in your body.

Asanas:

- Cat and Dog (Marjariyasana and Bitilasana)
- Down dog (Adho Mukha Svanasana)
- Mountain Pose (Tadasana)
- Sun Salutation
- Wide Leg Forward fold (Prasarita Padottanasana)
- Cobra pose (Bhujungasana)
- Head-to-knee (Janu sirsasana)
- Supported Bridge pose or Bridge pose (Setu Bandhasana)
- Inversion as per the ability (Viparita Karani)

Breathing Techniques:

- Kapalbhati pranayam (active exhalation and passive inhalation)
- Anulom Vilom (alternate nostril breathing). Always start breath from the right nostril, It increases the energy, efficiency of digestive system, and boosts the nervous system, especially the sympathetic nervous system. Alternate nostril breathing (Anulom Vilom) calms the nervous system and to bring the balance between sympathetic and parasympathetic nervous system.
- Practice guided relaxation at the end of the session for minimum 15 to 20 minutes