What is Trauma?

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One Step Rehab

Learning Objectives

By the end of this module you should be able to:

i. Describe the difference between PTSD and other types of traumatic stress.
ii. Have a basic understanding of how the nervous system works.
iii. Understand how the nervous becomes dysregulated in some people after experiencing a traumatic event.
iv. Understand some of the main methods used to treat trauma.
v. Understand how to conduct a basic body scan meditation to help 'ramp-down' some of the symptoms of traumatic stress.

Contents

1. Different Types of Trauma
2. Fight-Flight-Freeze
3. The Neurobiology of Trauma
4. Treatment
5. Post-Traumatic Growth
6. Building Your Resilient Zone

Exercise

References

1. Different Types of Trauma

The word "Trauma" originally referred to serious physical wounds that resulted from violence or accidents. This sense of the word is still used sometimes. For example, if someone has a brain injury resulting from a motorcycle accident, you might hear it referred to as 'brain trauma'.

In the 20th century psychologists began to realize that the term trauma could be used to describe psychological ill-health as well – especially when it had resulted from shocking or violent events. They began to study the effects of warfare on the human behavior and the way it effected the men who were on the front line of conflict for long time periods.

The term 'shell-shock' was first coined in World War 1 and is probably familiar to most people. This concept described men who had 'lost their senses' (become dissociated and delusional) due to intense enemy shelling or other forms of violent and prolonged bombardment.

By the 1970's, after an intensive study of the effects of war in Vietnam veterans, the term PTSD (Post-traumatic stress disorder) entered the medical mainstream and has been used ever since by medical bodies to describe clusters of symptoms that often result from exposure to traumatic events such as prolonged battle.[1] Those symptoms include:

- Flashbacks
- Nightmares
- Feeling emotionally numb
- Losing interest in activities that were enjoyable in the past
- Amnesia regarding the traumatic event.
- Hyper vigilance to threats (seeing threats that aren't there)
- Jumpiness, or an exaggerated startle response,
- Sleep disturbance (insomnia) – this might include problems of falling asleep, staying asleep, and restless sleep.

- Irritability and/or aggressive behaviour – frequent, irritable or aggressive behaviours that occur with little or no provocation.
- Problems with concentration – this is often confused with ADD (attention deficit disorder)
- Reckless or self-destructive behaviours

Slowly, it came to be understood that it was not just battlefield experiences which could lead to these symptoms, but also other life-threatening experiences, such as;

- Serious sexual assault and rape
- Extreme violence or being attacked by an animal
- Vehicle accidents
- Natural disasters
- Botched surgeries
- Witnessing such things in other people

Such events can cause individuals to enter a state of *post-traumatic stress* which persists over the long term. This might be diagnosed as PTSD, or it might not. Not all traumatic stress meets the strict criteria of PTSD, but that doesn't mean that it's not 'trauma'.

A very broad definition of trauma might be as follows:

> *"Any event which overwhelms an individual's ability to cope, and which creates ongoing consequences for the individual's mental and emotional health as well as their social functioning".*

So we should understand that when we use the word 'trauma', we are not necessarily talking about PTSD. Counseling psychologists often refer to this type of trauma (non PTSD trauma) as 'small t' trauma.

Small ‘t’ Trauma

Small ‘t’ trauma can best be described as fairly common life events that are experienced as upsetting, hurtful, or damaging. (In other words, they are adversities.) Much of the abuse, neglect or abandonment that we studied in module 4 on Adverse Childhood Experiences would fit into this small ‘t’ trauma category.

These events may not be as significant as shock trauma (which causes PTSD) but the emotional impact to the individual is still significant. Below are some examples

- Being bullied over a long time period (especially in early years)
- Being abandoned suddenly by a partner
- Divorce of parents in early years (3-12)
- Extreme poverty
- Changing schools frequently as a child and not fitting in
- Sudden unemployment or curtailment of career
- Being physically threatened on a regular basis

Complex Trauma

Complex trauma refers to trauma that comes from dwelling in an adverse environment over an extended time period. It is also sometimes referred to as “inescapable stress”. Over time the accumulative effect of this inescapable stress can be ‘traumatizing’ in the general sense of the word. Complex trauma results from its repetition, its prolonged nature, and its accumulation over time. Examples of this type of trauma would be multiple military deployments, long term domestic abuse, or even growing up in a very impoverished home or neighborhood.

Developmental & Relational Trauma

Relational Trauma refers to a type of complex trauma that most commonly develops within the context of relationships, usually the family of origin (your parents' household) or the nuclear family (you and your partner's household). An example of this might be growing up with a single parent who is mentally unwell.

Developmental trauma refers to complex trauma that develops during key stages of psychological growth in childhood and adolescence. As we saw in module 4, certain key lessons should be getting learned during those stages such as;

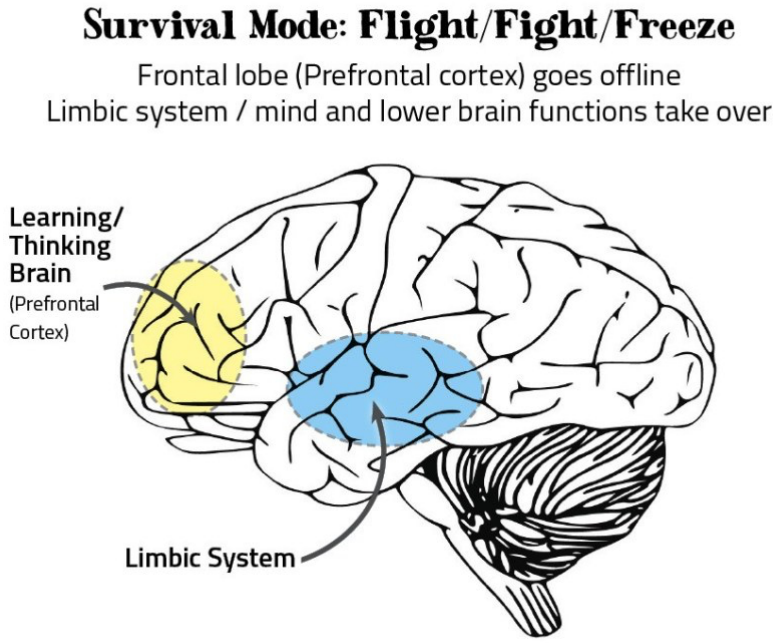
- The world is a safe place and there are people I can trust (0-2)
- I am able to exert my influence on my environment (2-4)
- My imagination is a superpower (5-8)
- I am competent because I have mastered certain skills/hobbies/sports and have been praised for it (9-12)
- I fit in and belong (12-18)

Sometimes problems at home or school (such as abuse, neglect or abandonment by parents or others) interferes with this process. In this case, healthy traits that should be developed in these stages (such as trust) are missing, and we end up as adults who are stuck in former stages of development or who have unresolved issues from former stages of development. We then invariably find dysfunctional coping mechanisms to deal with these developmental challenges (e.g. drug abuse).

2. Fight-Flight-Freeze

Both PTSD and traumatic stress in general, occur because of the way the human brain is designed, not because of an inherent weakness in the individual. As we saw in module 3 on addiction neuroscience, the brain is divided into older and newer sections (the limbic brain and the cortex). These brain areas developed at different times in human evolution. The cortex tends to control rational thought processes (cognition) while the limbic brain controls emotions and gives us an overall 'instinctive' idea of how to respond to things. It also helps us to regulate our automatic body functions coming from the deepest part of the brain. Things such as heart rate, threat detection, aggression and escaping. The limbic system doesn't need much input from the cortex to achieve this. It is quicker than the cortex and forms our first line of defense against incoming threats.

Fig. 1 The cortex (which controls rational thinking) is too slow in its processing ability to be of much use in an emergency situation and is often overruled by our 'animal' instincts



Two writers who have contributed greatly to our modern understanding of traumatic stress are the psychologist *Peter Levine*, and psychiatrist **Besel Van der Kolk**. Both of them have studied what is known as the body's 'fight-flight' response. Fight-flight response is an automatic bodily reaction that occurs whenever we experience an emergency or life threatening situation (or what we 'think' is a life threatening situation). When this happens we don't actually 'think' our way out of it. Our body takes over and we leap into action.

In his book 'Waking the Tiger' Levine explains how one of the things that prevents ongoing traumatic stress (even when something terrible has happened) is that the person is able to mount a successful fight or flight response. In other words, they managed **to do something about it**. Being able to successfully fight or flee helps greatly in overcoming the traumatic event. If fight or flight is successful, then our nervous system helps us to gradually regain our composure.[2]

However, if for some reason this instinctual response is blocked (for example, if we are trapped, or being held down) then we might 'freeze'. During this freeze response the brain continues to secrete stress hormones and other distress signals long after the actual threat has passed. This is what causes trauma. People suffering from post-traumatic stress are stuck in a battle they feel they cannot win, and then become ingrained in pattern of trying to escape from a threat which is long gone.

- **Fight** – when we are in danger, if we believe that we can win then we instinctively 'fight' back without thinking about it
- **Flight** – If we instinctively know we are unlikely to win, then we run without being able to control it
- **Freeze** – If we instinctively feel we are likely to die, then we freeze to make our impending death less painful

The technical word for fight-flight is **hyperarousal**. And the technical term for 'freeze' is **the immobility response**.

3. The Neurobiology of Trauma

In his book 'The Body Keeps the Score' Besel Van der Kolk digs deeper into how the fight or flight response works biologically to keep us safe and why this sometimes goes wrong causing ongoing post-traumatic stress symptoms.[3]

We take in information through our five senses - *touch, sight, sound, smell and taste*. Part of the limbic brain called the *thalamus* receives these impressions and mixes them together to form an overall story - "what is happening to me?" (see fig. 2). This is only a cursory overview which is designed to make us respond quickly, because during our evolution animals that responded quickly to danger survived at a greater rate than those who did not, and so organisms developed threat detection systems that reacted quickly rather than accurately. A more accurate assessment can be made later, and either confirmed or denied. This quick summary of what is happening is then passed on along two different brain pathways which Van der Kolk calls the 'low road' and the 'high road'. But before we describe those two different brain pathways we need to understand the bodies nervous system.

PNS and SNS

The **nervous system** is the most important body function in terms of post-traumatic stress. The nervous system extends from the brain through the spinal cord and out into all the extremities of the body. It has has two complimentary systems which are controlled largely by the limbic brain. They are:

- The sympathetic nervous system (**SNS**)
- The para-sympathetic nervous system (**PNS**)

The SNS controls arousal (including the fight-flight response). It is called *sympathetic* because it works **with the emotions**. It moves blood to muscles and uses adrenal glands to release adrenaline to make us responsive and athletic. For this reason Van der Kolk refers to it as the body's 'accelerator'.[4]

The *parasympathetic* nervous system (PNS) is so-called because it works **against the emotions.** It controls self-preservation mechanisms like healing, digestion and rest, and reverses arousal by releasing acetylcholine. Acetylcholine is a neurotransmitter that is found in the body as well as the brain. It helps to relax muscles and return our breathing to normal after exertion or stress. For this reason van der Kolk likens it to the body's 'brake'.[5]

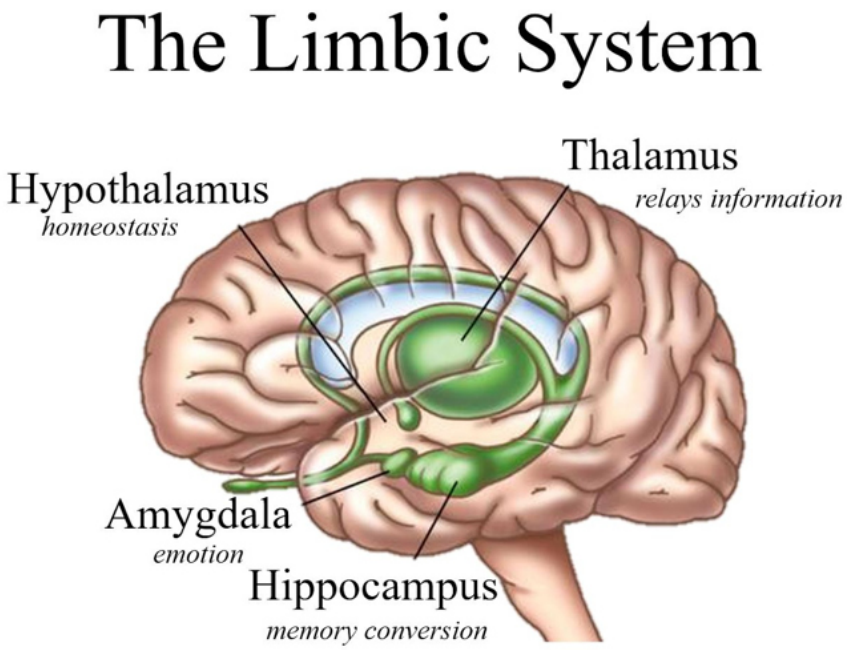
Together, the accelerator (SNS) and the brake (PNS) help us to constantly return to a state of *homeostasis* (balance). Humans, like other animals need to constantly switch between states of arousal and periods of rest, and the bodies nervous system helps us to accomplish that.

The Threat Detection System ('Low Road')

So as we mentioned the bodies threat detection system starts with the *thalamus* which takes information in from the 5 senses and creates a basic evaluation of incoming threats. After this basic assessment the incoming information is sent in two directions, the 'low road' and the 'high road.'

The low road goes to the *amygdala* in the limbic brain. The *amygdala* has to work out whether or not the basic summary given by the *thalamus* represents a real threat. It is helped in this regard by a nearby brain area called the *hippocampus*. The *hippocampus* relates new experiences to old experiences and asks "have I seen something like this before?" or more specifically, "have I seen something BAD like this before?" If both the *amygdala* and the *hippocampus* agree that "yes, we have seen something like this before and it was BAD" - then the *amygdala* sends a reply message back to the *Hypothalamus* (which is an extension of the *thalamus*) saying "Confirmed! Threat detected." One of the jobs of the *hypothalamus* is then to activate the nervous system to release stress chemicals like *adrenaline*.

Fig. 2 The brain's threat detection system. ('Low road')



The Threat Detection System (High Road)

The 'high road' of the threat detection system goes from the *thalamus* to the *medial prefrontal cortex* (PFC) and takes slightly longer. It's job is to conduct a final and much more detailed review of the threat. The emotional brain areas were incapable of doing this because they only looked at the emotional tone of the situation or the 'big picture' and asked "where have I seen this before?" The PFC however, takes a more careful look and if it decides that this is not a real threat after all, then it can send a message back to the *hypothalamus* saying that the stress chemicals are not required and the PNS will secrete calming chemicals (such as *acetylcholine*) to restore balance.

In PTSD (and to a lesser extent in other small 't' traumas) the limbic system is hyper-active which effectively creates a disconnect with the PFC. This hampers the individuals ability to correctly diagnose the level of threat and calm down. In particular, people with trauma tend to read social situations and cues (such as facial gestures) wrongly. Consequently the traumatized person is almost always in collision with something or someone.

People who are traumatized have a harder time working out what is a real threat and what isn't due to having a hyper-vigilant (low road) threat detection system. So this becomes a vicious cycle whereby the threat detection circuit over-emphasizes the size or immediacy of the threat and continues to pump out more stress hormones like adrenaline. Constantly elevated stress levels take a terrible toll on the body over many years. This causes knock-on emotional and physical health problems in the short term such as; sleep disorders, memory and attention problems and constant irritability, and may also cause serious long term and chronic health problems such as heart disease.

To an extent, our threat detection systems are also determined by serotonin levels, meaning that people with low levels of serotonin may be more susceptible to the symptoms of traumatic stress. For example, animals with low serotonin are known to be hyper-reactive to stressful stimuli such as loud noises. One of the things that we know can contribute to low serotonin levels is perceiving oneself to be of low status (within a given hierarchy).

So in summarizing the nervous system we can say:

- Our nervous system is heavily involved in the regulation of stress.
- Our sympathetic nervous system (SNS) works like an accelerator, which enables us to be responsive and athletic
- Our parasympathetic nervous system (PNS) works like a brake to bring us back to a state of rest.
- When we perceive a potential threat the *amygdala* and *hippocampus* get activated. Their job is to fetch up negative memories that help create a 'safety bias'.

Usually this safety bias works to keep us safe. However, people who suffer post-traumatic stress seem to continue this negative bias in a pathological way. One of the other jobs of the Hippocampus is to process and store short term memory into long term memory. However, due to the inability to resolve the

traumatic situation (fight or flee) this traumatic event gets stuck as 'working memory'. The end result is that the traumatic memories can continue to feel real as though they were happening now.

4. Treatment

So what the 'low road' / 'high road' dichotomy teaches us is that there are two options for dealing with post-traumatic stress.

A **top-down** method which would use the high road (cortex). This would involve reasoning or words. Methods like counseling.

A **bottom-up** method which would use the low road (limbic brain + nervous system). This method might use things like breathing techniques to 'ramp-down' the nervous system directly. (Also things like yoga and meditation, or even sports, if they create a relaxed feeling afterwards).

Body Based Therapies

Top-down therapy (counseling) has its place, but the bottom-up method (known as body-based therapy) is fast becoming the go-to method for treating ongoing post-traumatic stress symptoms, because it works directly on the persons physiology and most especially on the nervous system. The best way to understand this is to consider the following analogy of the horse and rider.

The battle between the rational brain and emotional brain can be thought of as a horse and its rider. The horse is the emotional limbic brain and the rider is the rational human brain. They are working together, but should the horse get startled then the rider is going to have a difficult time controlling him. It can be done, but it's not easy. Whenever this happens, even rational people can get a disconnect between their emotional brain and their frontal lobes and stop listening to reason.

Interestingly, the SNS and PNS (or adrenaline and acetylcholine, to look at it another way) are quite easily manipulated by breath. Breathing is one of the few functions that is driven by both conscious and unconscious action (cortex and limbic brain). In other words, it happens by itself but we can change how it happens.

When we breathe in, we get a burst of *adrenaline*. And when we breathe out we get a slug of *acetylcholine*. This is why we breathe in sharply before doing anything scary or taxing, and why we exhale when we are relieved or trying to calm down.

This is what lies behind the effectiveness of things like meditation, yoga and breathing exercises, and why they have been used for so long by humans to help them regulate their own nervous systems.

In addition, physical movement and physical activity in general can help to ameliorate the effects of traumatic stress.

It should be noted that modern treatment programs (like Alpha) have greatly expanded the repertoire of activities that could be considered 'body-based'. For example, in 2019-2021, Alpha Sober Living ran a Jiu-Jitsu program for young men leaving treatment, and previously, our rehabs have used techniques like triathlon training and weight lifting to help people get back in touch with their bodies. Provided it is done within safe bounds and an understanding that the whole goal is to achieve overall relaxation, greater social interaction and an expanded sense of well-being - almost any sport could potentially be used as a body-based therapy.

Cognitive Behavioral Therapy (CBT)

CBT believes that the way people think affects their feelings. Its main goal therefore is to help people feel differently by changing the patterns of their thinking. One of the ways we do this is by using a tool called ABC, where we

identify thoughts which may be irrational, and then dispute those thoughts. Group therapy can be particularly helpful in this regard.

Results from a 2018 systematic review found good evidence to support CBT as an effective treatment of PTSD as well as depression.[6] Since 2016, CBT has also been considered the standard of care for PTSD by the United States Department of Defense.[7] Internet-based CBT programs have also been studied and found to be as beneficial as face-to-face CBT programs.[8]

5. Post-Traumatic Growth

Post-traumatic growth (PTG) is a theory that was developed in the 1990's after psychologists *Richard Tedeschi* and *Lawrence Calhoun* noticed that people who endure trauma can often see positive growth afterwards. This is a phenomena that has also been noted by other clinicians such as *Besel Van der Kolk.*

"I found that the more traumas they have had in their background, the more creative and successful they often become. It's the people who have had to struggle who often see new possibilities and have no choice but to discover new options."

Van der Kolk. 2015

One theory as to why this might occur is to be found in the field of biology.

Hormesis & PTG

Hormesis is a biological phenomenon whereby a beneficial effect (improved health or stress tolerance for example) results from exposure to low doses of an agent that is otherwise toxic or lethal when given at higher doses. An example would be the practice of some Amazonian tribes of administering low doses of poison as initiation rituals for young men. (NOTE: don't try this at home!)

Post-traumatic growth (PTG) appears to work along similar lines according to the principles of hormesis. PTG is a positive psychological change experienced as a result of adversity and other challenges in order to rise to a higher level of functioning.[9] According to Tedeshi & Calhoun;

"Growth does not occur as a direct result of trauma, rather it is the individual's struggle with the new reality in the aftermath of trauma that is crucial in determining the extent to which posttraumatic growth occurs"

Five areas of PTG

There are five areas where people previously suffering PTSD or other traumatic stress reactions have been observed to experience transformational growth.

1. Personal strength
2. Relationships with others
3. New perspectives on life
4. Appreciation of life
5. Spirituality

However, we should note that these growth spurts are the result of actions on the part of the individuals to locate resources, support structures and methods of dealing with their symptoms of trauma.

To this end we will devote the final section to briefly explore some of these methods.

6. Building Your Resilient Zone

As we have seen when a traumatic event occurs the nervous system is affected. When this happens even ordinary tasks can become difficult. People suffering traumatic stress can yo-yo between **hyper-aroused** (manic) states, and **hypo-aroused** states. (Hypo means low, so a hypo-aroused state in depression and lethargy).

One of the goals of trauma recovery is to build what psychologists call the **resilient zone**. The resilient zone is the ideal ground between a hyper and hypo-aroused state. When you are in your resilient zone you are better able to handle life. This manifests as clearer thinking, calmer feelings and physical energy.

Below are some of the factors that contribute to resilience.

- Membership of mutual aid groups like AA, NA, SMART Recovery or Refuge Recovery
- Good relationships with family and friends
- Building a positive view of yourself
- Having confidence in your strengths and abilities
- Being able to regulate your feelings and impulses
- Developing patience and problem-solving skills
- Working on communication skills and strategies
- Being able to ask for help (from the right people)
- Resisting 'victim mentality' and assuming ownership of situations
- Coping with stress in healthy ways (e.g. sports, meditation, breathing exercises)
- Avoiding (or preferably abstaining from) harmful coping strategies, such as substance abuse
- Helping others and doing service work in the community
- Creative pursuits such as reading, writing, dancing or music making

Exercise: Body Scan

In order to build a resilient zone we need first to be able to identify when we're not in it. In other words, we need to be able to see when we are in a hyper or depressed state.

'Body scanning' means noticing the sensations within the body. It is one of the central techniques used in the Mindfulness tradition found in South East Asia (particularly in Myanmar).

The goal is to bring 'deadened' parts of the body alive by placing one's attention on them.

1. Sit or lie down comfortably. If you are sitting you can be kneeling or cross legged or even sitting in a chair, but if you sit in a chair then make sure that your back is straight and your feet touch the floor. You can also lie down.
2. Scan your body slowly from the top of the head to the bottom of the feet. Feel each area relax as you move your attention past it. This can take anywhere between 2 minutes to half an hour depending on how fast you go. An ideal time frame is 10 minutes.
3. As a guide, master meditators in the Buddhist tradition may take each body part, about the size of a stamp, and concentrate on it for several minutes before moving on. Obviously you don't have to do this. Start with a whole body part, like the head, the neck, or the upper left arm, and place your attention there for a minute before moving on.
4. Don't allow sensations in other parts of the body distract you from the part of the body you are concentrating on. Obviously if you are in pain, then you should attend to the source of that pain, but otherwise try not to let minor aches or itches distract you from the order in which you are moving across the body.
5. Afterwards, perhaps make a mental note of whether you were experiencing mostly pleasant, unpleasant, or neutral feelings. And if

which body areas. Also note if there were any areas that felt 'empty' or dead (e.g. where you couldn't feel any sensations).

6. After some time you should find that your body awareness begins to increase and parts of the body that used to be lacking in sensation are now 'alive'.
7. If this practice doesn't work for you then use resources on the internet to find other guided meditations that do. Keywords you might want to use to search for guided meditation resources are:

- *Vipassana meditation*
- *Body scan meditation*
- *Sweeping meditation*
- *Mindfulness*

References

1. See; DSM-V. Trauma- and Stressor-Related Disorders. American Psychiatric Association, 2013

2. See; Levine P, Waking the Tiger: Healing Trauma. North Atlantic Books, 1997.

3. See; Van Der Kolk B. The Body Keeps the Score: Mind, Brain and Body in the Transformation of Trauma. Penguin, 2014.

4. Ibid. p77

5. Ibid.

6. Forman-Hoffman, Valerie; Cook Middleton, Jennifer; Feltner, Cynthia; Gaynes, Bradley N.; Palmieri Weber, Rachel; Bann, Carla; Viswanathan, Meera; Lohr, Kathleen N.; Baker, Claire; Green, Joshua (17 May 2018). "Psychological and Pharmacological Treatments for Adults With Posttraumatic Stress Disorder: A Systematic Review Update". doi:10.23970/ahrqepccer207.

7. "Treatment of PTSD – PTSD: National Center for PTSD". U.S. Department of Veterans Affairs. 26 May 2016. Archived from the original on 1 December 2016.

8. Lewis, Catrin; Roberts, Neil P.; Bethell, Andrew; Robertson, Lindsay; Bisson, Jonathan I. (14 December 2018). "Internet-based cognitive and behavioural therapies for post-traumatic stress disorder (PTSD) in adults". The Cochrane Database of Systematic Reviews. 12: CD011710.

9. Tedeshi, RG & Calhoun, LG. (2004). “Post-traumatic Growth: Conceptual Foundations and Empirical Evidence”. Psychological Enquiry. Vol 15. No 1. 1-18