



**STRESS AND THE
IMMUNE SYSTEM:**

**HOW TO COMBAT
THE DAMAGING
EFFECTS OF
CHRONIC STRESS**

Continuing Education E-Book



T E X A S
M A S S A G E C E U

Melissa Wood, ND, MTI, LMT

STRESS AND THE IMMUNE SYSTEM: HOW TO COMBAT THE DAMAGING EFFECTS OF CHRONIC STRESS



6 HOUR CONTINUING EDUCATION UNIT CLASS

Approved by the Texas Department of Licensing and Regulation (TDLR)



STRESS AND THE IMMUNE SYSTEM: HOW TO COMBAT THE DAMAGING EFFECTS OF CHRONIC STRESS

Welcome to the Stress and the Immune System: How to Combat the Damaging Effects of Chronic Stress online continuing education class!

Class Objective: This online class has been developed to educate Texas Licensed Massage Therapists on Chronic Stress and how it impacts our lives, our health and what to do to try to alleviate it. This will benefit not only the therapist in their own life but will help them to better help their clients and give them tips to help manage their stress level. It is my hope this material will be interesting, educational and a valuable resource to assist you with working with massage therapy clients.



About the Instructor

My name is Melissa Wood and I am a Naturopathic Doctor, Massage Therapy Instructor and Licensed Massage Therapist located in Sherman, Texas. I have been studying alternative and natural medicine for over 25 years.

My mission is to enable everyone on this planet to be healthy and to be actively involved in their health and healing. My goal is to offer information that will provide you with new insights that are useful in your path to wellness. I envision a time when everyone will seek out herbs, essential oils, vitamins, minerals, nutritional supplements, and whole foods (not processed food!) to help heal themselves, as these are very powerful tools for enhancing your health and well-being.

APPROVED MASSAGE THERAPY INSTRUCTOR

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Disclaimer

I am a Naturopathic Doctor (N.D.), Massage Therapy Instructor (MTI), Licensed Massage Therapist (LMT), and an Approved CE Provider in the State of Texas. I am NOT a Medical Doctor (M.D.). I have been trained in holistic and natural therapies for the body and do not diagnose any medical condition nor prescribe any medications. Should you need immediate medical or psychiatric assistance, please telephone 911 or seek immediate treatment at an emergency room hospital. Nothing listed within this e-book class should be considered as medical advice for dealing with a given problem. You should consult your healthcare professional for individual guidance for specific health problems. It is understood that the author is solely responsible for the content of this work and is **NOT** responsible for your usage of said information, either personally or professionally, with your clients. In addition, you should ALWAYS encourage your clients to see their healthcare professionals for help with any medical issues they are having.

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Melissa M. Wood, ND, MTI, LMT

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INTRODUCTION: STRESS AND THE IMMUNE SYSTEM



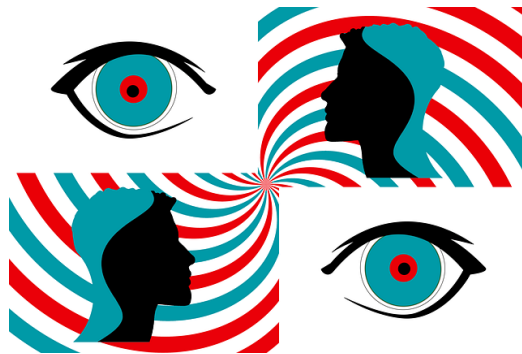
*Stressed out. Under the gun.
Overworked. Burnt out. On edge.
Behind the eight ball. Burning the
candle at both ends. Keyed up.
Spent.*

Do these phrases sound like someone you know? Perhaps they remind you of one of your massage

clients, or maybe even yourself? Stress has become such a constant element in our lives that we've coined dozens of expressions to describe its effect on our lives, moods and attitudes. Stress can start to pile up at work, especially if we feel trapped in a dead-end job or have to contend with conflicts with co-workers. At home, many of us face the constant juggling act of raising a family while making ends meet. Even young people at school are under more pressure than ever before.

The Anxiety and Phobia Workbook adds, *"What else has changed in the past few years? Many of us feel more anxiety as a result of the increased risk of terrorism...When this threat is added to all of the other sources of anxiety—the pace and complexity of modern life, the general lack of consensus about standards and values to live by, and the overall level of social alienation fostered by post-industrial society—it's clear that anxiety is a built-in feature of life in the modern world. It's not likely to go away any time soon."*

For more Americans than ever before, stress has become more than just a daily nuisance but an enemy that is putting their health and wellness into jeopardy. When a person’s brain and body are constantly revved up, the detrimental effects are widespread: their muscle tension increases, and their heart rate and blood pressure remain elevated. Harmful levels of fats, cholesterols, sugars, hormones and other chemicals can linger in the blood. Over prolonged periods, these chemicals (which are designed for occasional short, intense, bursts of activity) can eventually cause serious damage to important body organs and impair immune function.



What Is Stress?

Stress does not discriminate - whether we are old or young, facing stress from school, work or advancing age, severe stress can take a heavy toll on our immune system and quality of life in our long-term health.

According to one expert, stress can be defined as “any physical, chemical, or emotional factor that causes bodily or mental tension.” Although mild amounts of stress can actually be beneficial (see the Did You Know box below), stress is damaging when it becomes overwhelming, unmanageable or unrelenting over a long period of time.

How Your Body Reacts to Stress

Experts tell us that when the body encounters stress, it instantly jumps into action. A flood of complex neurochemicals and hormones rushes through the entire body, activating every organ and system into a stress response.

You can tell when this Red Alert response begins in your body because all of your senses are involved – including sight, touch and hearing. Your brain quickly responds and your adrenal glands start releasing



powerful hormones that increase your muscle function. Your heart and lungs start working harder too in order for your body to cope with the physical demands of a stressful situation. On the hormonal level, when your body detects a sudden spike in emotional stress, it releases chemicals from the hypothalamus (a hormone called corticotrophin-releasing hormone that works to suppress appetite, increase anxiety, improve memory and selective attention),¹ >>> which then stimulates the pituitary gland to release the hormone Adrenocorticotropic Hormone ACTH >>> which in turn prompts the adrenal glands to release cortisol--the primary stress hormone--and the neurotransmitter norepinephrine. This stress response is nature's built-in alarm system to work with the brain to control mood, motivation, and fear. Together, these effects coordinate behavior to develop and fine tune the body's response to a stressful experience.

In a true emergency, this powerful stress response is actually a helpful protection mechanism. For example, if you need to suddenly jump out of the way of an out of control car, having dilated pupils to give more accurate visual cues and increased muscle and cardiac function to propel you out of harm's way could help to save your life! However, the situation is different when the stress is unrelenting day in and day out and the body is forced to remain in high alert for weeks or months (or sometimes even years!) on end.

When a person's immune system has been compromised by constant stress and anxiety, they become vulnerable to everything from the common cold to cancerous tumors and autoimmune diseases. Severe stress will often manifest itself in physical symptoms like back pain, headaches and muscle spasms. It can also lead to chronic conditions like irritable bowel syndrome or more serious illnesses like stroke, heart attack and diabetes. Stress is a detriment to mental and emotional health too - people who fail to get relief are often less productive, have diminished enthusiasm for life and find themselves coping with strained personal relationships. Severe stress has also been linked to increased feelings of aggression, clinical depression, and burnout.

This e-book continuing education class will increase your awareness of how stress can have an enormous impact on all aspects of a person's well-being. We will dig deeper to see what actual physiological effects stress can have on the body and specifically on the immune system.

DID YOU KNOW?

While we want to keep stress levels in check, we would never want to live an entirely stress-free life that eliminates the body's need for a stress response altogether. Why not?

In healthy doses, stress can actually be exhilarating, like riding a horse. It can give us an enjoyable change of pace and an exciting ride. However, if the horse suddenly goes wildly out of control, or the ride lasts for much longer than we'd like, it can become dangerous or even put our life in danger. Similarly, when we experience small doses of stress, it can actually make life exciting, stimulating creativity, positive energy and healthy activities. But when stress is ongoing and chronic, it can wreak havoc with our immune system.

As the world witnessed a global attack on immune systems by the Covid-19 pandemic, a study done by a German university confirmed



that chronic stress contributed to an increase in respiratory infections and spread of the COVID-19 disease.

"Stress is generally regarded as pathogenic, with abundant data supporting a detrimental neuroendocrine-immune effect of chronic psychosocial stress on viral infections. Reduction of chronic psychosocial stress can therefore have beneficial effects and potentially prevent infections or contribute to a milder course of viral respiratory diseases."²

On the bright side, the study acknowledged that not all stress is detrimental. As mentioned above, *short-lived* stress makes life exhilarating. *Brief* bursts of stress can actually activate and boost immunity, reducing risk of infection and progression.



"The antidote for a virus-favoring immune constellation therefore seems to be a well-trained neuroendocrine-immune stress response, which can be

generated by a balanced degree of activation alternating with relaxation, and that shapes an immune response that is optimally equipped for the challenges imposed by new infectious agents."³ – Eva

M.J. Peters, "Neurobiology of Stress"

As massage therapists, we have our fair share of stress to contend with, so it will be helpful to learn effective coping strategies to keep tension in check as you balance a demanding career and personal life. In our role as complementary healthcare professionals, we also want to be alert to the signs and symptoms of stress-related and auto-immune illness in the clients we treat. Doing this will help you to offer your clients the best care possible and help them to cope with stress effectively so they can get the most out of life. We will also address the tell-tale signs of post-traumatic stress disorder (PTSD), which now affects more Americans than ever before. And finally, we'll introduce some healthy lifestyle choices that you can implement yourself and share with your clients to help keep your immune system running at its peak potential. Let's get started!

CHAPTER 1: A GLIMPSE INSIDE THE IMMUNE SYSTEM

Our first chapter will help us to take a closer look at the body systems involved in immune function to get familiar with the arsenal of defense systems it uses to keep the body running smoothly.

What is the Immune System?

The immune system is an amazingly complex network of cells, tissues and organs. Its secret weapon is an incredible communications network made up of millions of cells that can identify and remember the countless foreign invaders that try to enter our bodies each day. On any given day, we are exposed to hundreds (if not thousands) of chemicals and toxins in our food supply, our water and the air we breathe.



We are often exposed to hundreds of chemicals before we even leave the house in the morning! As soon as the immune cells receive an alarm of an intruding microbe (such as a parasite, bacteria or fungus that can cause

illness), the system responds by secreting powerful chemicals. These substances can act in a number of ways by either: helping the cells to regulate their own growth and behavior, enlisting the help of other immune cells, or guiding the new helper cells to trouble spots within the body.

The immune system works so well, we usually only notice it when it starts to shut down for some reason, or when it produces a noticeable side effect like an itchy red bump following a mosquito bite!

DID YOU KNOW?

Researchers from several institutions reported that over 90 years after the most lethal flu in history, survivors' bloodstreams still carried highly potent antibodies to the 1918 virus.

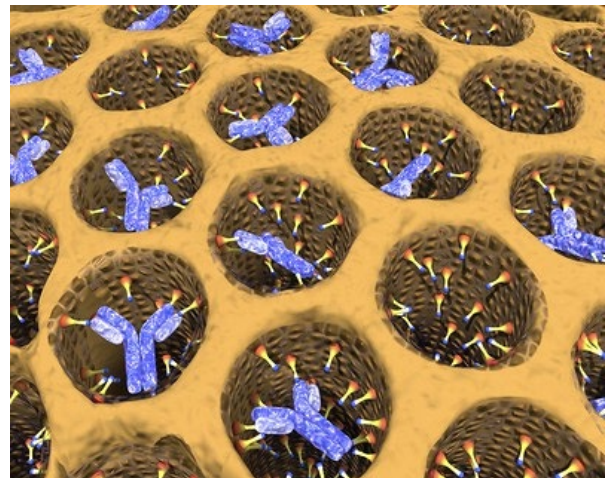
The International Herald Tribune commented that this demonstrates "the remarkable durability of the human immune system." When scientists examined blood samples from elderly survivors of the Spanish-flu, they found "antibodies that still roam the body looking to strangle the old flu strain." Using these antibodies, researchers were able to replicate a vaccine that successfully cured mice that had been injected with the killer strain of flu.

The power of the immune system and its incredible memory for invaders amazed researchers. One scientist exclaimed, "The Lord has blessed us with antibodies our whole lifetime! What doesn't kill you makes you stronger." ⁴

There are volumes that could be written on just the key functions of the immune system. For the purpose of this class, we'll consider the major components of the immune system to better understand how the various parts all work together in a healthy person. These components are:

Antibodies:

Antibodies (also called immunoglobulins and gammaglobulins) are Y-shaped proteins that are produced by white blood cells. At the tip of each branch of the Y is a special receptor that responds to a specific antigen (either a virus, toxin or bacteria) and binds to it in order to disable the toxin.



Antibodies

This binding action prevents the toxin from damaging the body by disabling its chemical properties or preventing it from moving through cell walls. Sometimes several antibodies will bind to a single invader to alert the complement system (which is described below) that the invader needs to be destroyed or removed.

There are five classes of antibodies, and you will often notice the abbreviated forms used below in medical documents and journal articles:

Immunoglobulin A (IgA)
Immunoglobulin D (IgD)
Immunoglobulin E (IgE)
Immunoglobulin G (IgG)
Immunoglobulin M (IgM)

Thymus:

The thymus is located between the breastbone and the heart. It plays an important role in producing T-cells (see below under Lymphocytes) and is vitally

important in newborn babies. Without a properly functioning thymus, a baby's immune system breaks down and eventually the baby will die. As a person gets older, other parts of the immune system are able to compensate for the thymus' function, making it not as critical in adults.

Spleen:

The spleen acts as a filter for the blood. It catches old or damaged blood cells as well as foreign invader cells.

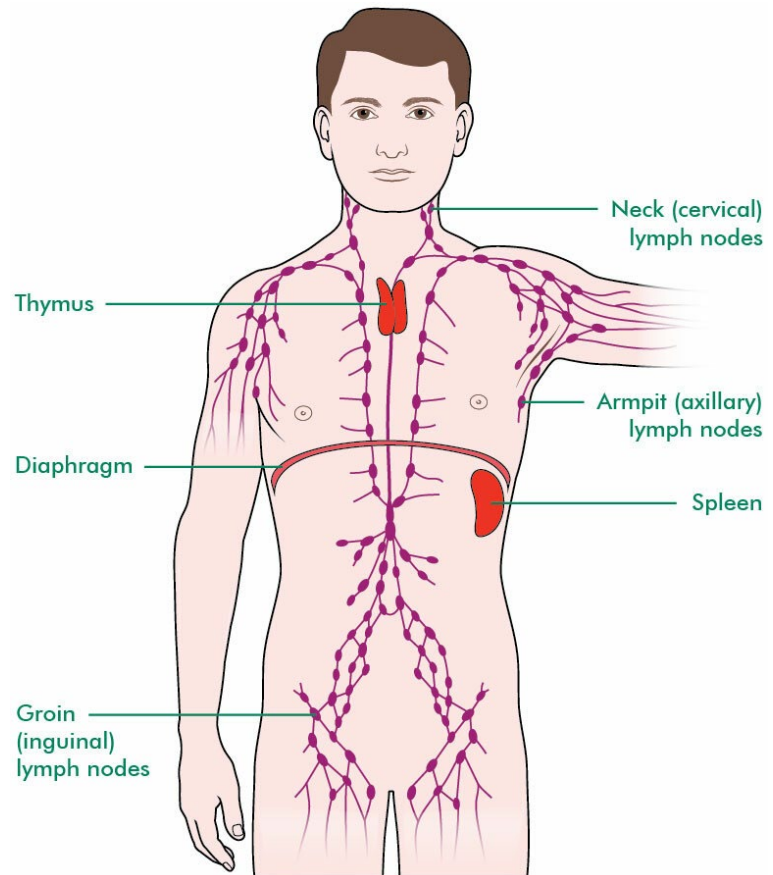


Image source: <https://www.macmillan.org.uk/cancer-information-and-support/thymus-cancer/the-thymus-gland>

Bone marrow:

New blood cells, both red and white begin as “stem cells,” which are produced in the bone marrow. Stem cells are unique because they have the ability to branch off to become several different types of cells. Red blood cells are fully formed in the marrow before they enter the bloodstream, whereas certain types of white blood cells mature elsewhere in the body.

THE COMPLEMENT SYSTEM

↳ 'COMPLEMENT' ANTIBODIES

* GROUP OF PLASMA PROTEINS
↳ COMPLEMENT PROTEINS

* PRODUCED IN THE LIVER
↳ HELP DESTROY PATHOGENS

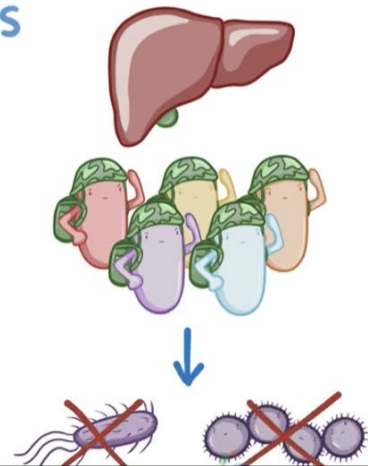


Image source: https://www.osmosis.org/learn/Complement_system

Complement System:

The complement system is a specialized group of proteins manufactured by the liver. While there are millions of different antibodies in your blood stream that are used to fight off a specific antigen, there are just a handful of proteins in the complement system, all of which float freely throughout the bloodstream. Complement proteins work along with antibodies. Once these proteins are activated, they cause cell lyses (death) by attaching to the

invader and destroying it. They also help by communicating to phagocytes, a type of cell (often a white blood cell) that is able to engulf and absorb waste material, harmful microorganisms, or other foreign substances that need to be removed from the body.

Hormones:

There are a number of hormones that can either support or suppress proper immune function. Thymosin is a hormone that is believed to be manufactured by the thymus. It encourages the production of lymphocytes (a type of white blood cell – read more below). Interleukins are another type of hormone that is generated by white blood cells. Interleukin-1 occurs after a macrophage destroys a foreign cell. When Interleukin-1 comes in contact with the hypothalamus, it causes fatigue and fever, which assists the body in killing harmful bacteria. Other hormones, such as steroids and corticosteroids (which are precursors of adrenaline) are known to have effects on the body that suppress the immune system.

White Blood Cells:

White blood cells are one of the most vital components of the entire immune system. The expression “leukocyte” (or white blood cell) is actually a general term that has an enormous collection of unique cells that work together to destroy foreign invaders. There are over a dozen types of white blood cells that can be grouped into 3 main sub-categories:

Granulocytes:

Almost half of all white blood cells are granulocytes which contain granules of different chemicals, depending on the type of cell. There are three classes of granulocyte:

- basophils
- eosinophils
- neutrophils

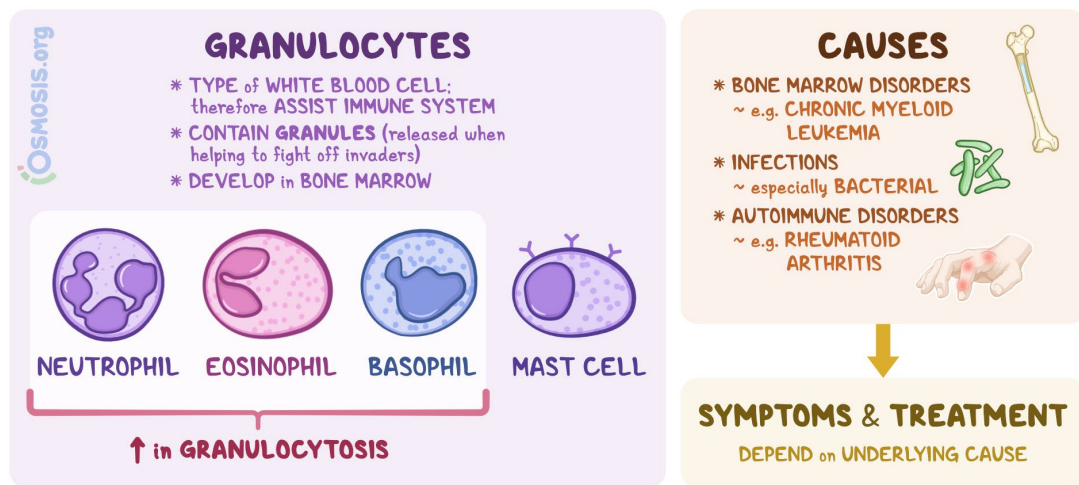


Image source: <https://www.osmosis.org/answers/granulocytosis>

Lymphocytes:

The second largest group of white blood cell is lymphocytes, a type of cell that is responsible for fending off most of the bacterial and viral infections that enter the body. Both helper T cells and B cells can be found in the bloodstream, but they are more concentrated in lymph tissue such as the lymph nodes, the thymus, the spleen and digestive system. When stimulated, B cells mature into plasma cells which are capable of producing antibodies. Each B cell is able to detect a specific

germ. When the germ is identified by a B cell, it will clone itself into millions of antibodies designed to destroy the germ. T cells do not produce antibodies, but instead attack foreign antigens by attaching to them and destroying the invader cells.

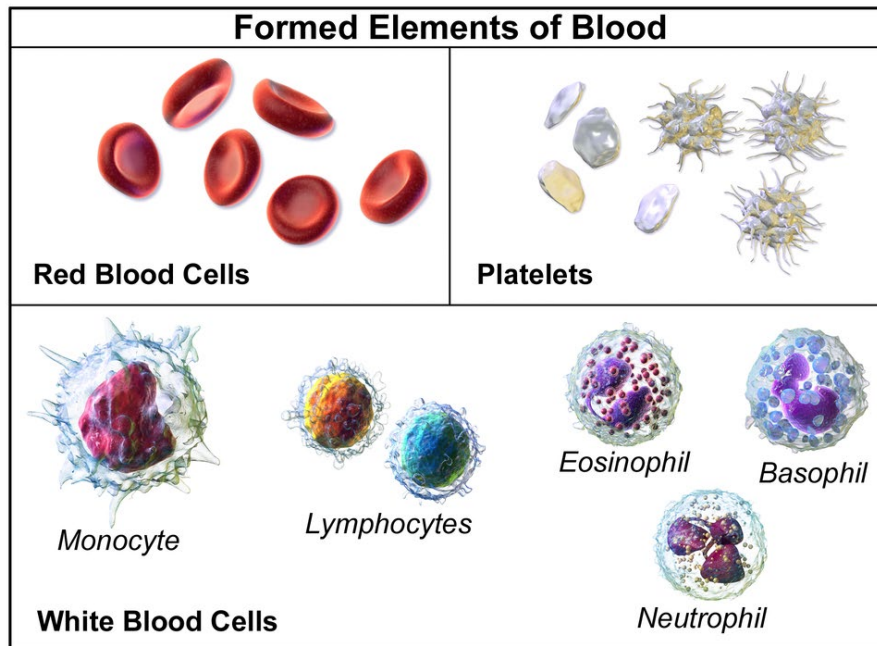
Lymphocytes are divided further into two classes depending on where the cells mature:

- B cells (which mature in the bone marrow, evolving in plasma cells)
- T cells (which start in the marrow but mature in the thymus, evolving into Killer, Suppressor or Helper T cells)

Monocytes:

Monocytes are the smallest group, making up only approximately 7% or so of all leukocytes. Monocytes eventually develop into macrophages.

- Macrophages
- Monocytes



Unlike other cells in the body, white blood cells are unique in that they are able to act like living single-cell organisms. They can move independently and trap invading substances completely on their own. Most white blood cells do not divide to reproduce but are produced in the bone marrow, as was discussed above.

As you can see, the immune system is a marvelous, multi-level protection mechanism that works around the clock, protecting our bodies from the millions of viruses, toxins and parasites that we come into contact with each day. Now that we have a better grasp of how the immune system functions under normal conditions, we can consider what happens when something goes wrong - as in the case of auto-immune disorders and damage from long-term stress.

CHAPTER 2: AUTO-IMMUNE DISORDERS

As we discussed in Chapter 1, the immune system provides our bodies with a powerful defense system. However, when this system is weakened and suddenly selects the wrong target (like friendly fire against the body it is meant to protect), a chain reaction of disorders can easily result. This reaction can trigger illnesses like Chronic Fatigue Syndrome, Rheumatoid Arthritis, allergic diseases and more.

Research into the human genome has revealed much about the effects of the stress hormone cortisol on our bodies. Cortisol increases sugars (glucose) in the bloodstream, enhances your brain's use of glucose and increases the availability of substances that repair tissues. Cortisol also curbs functions that would be nonessential or harmful in a fight-or-flight situation. Scientists have discovered that the action of cortisol is much different when the body experiences intense stress over a prolonged period. This type of chronic stress causes a cascade effect of gene activations, which ultimately weaken the immune system.



Although these advances in science and technology are helping us to understand more about the immune system than ever before, researchers continue to look for answers regarding how a properly functioning body targets its attacks without damaging healthy cells and tissues. By tagging specific immune cells, scientists are hoping to pinpoint which type of targets can trigger an unwanted immune response.

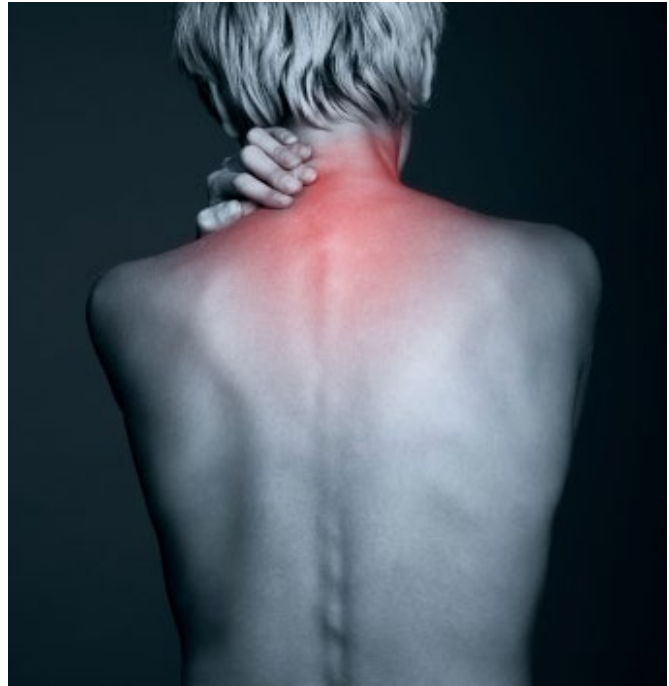


Certainly, in my Naturopathic practice, I am constantly seeing clients that are having issues with their immune system. Auto-immune diseases are on the rise. In my opinion, there are many reasons for this; diet is certainly key, but as the

subject of this e-book class, **stress** is also a major factor. Too many people are living at a VERY hyper state; there is the job (that maybe they don't like); the family obligations; church functions; social commitments; friends; extended family; health problems, etc., etc. Throw in some financial/economic concerns, worry about terrorist activity and other major stresses like these and it's a recipe for **STRESS**. When a person is eating a predominantly fast-food or processed food diet **AND** living a life that is high in stress, an autoimmune disorder is sure to follow.

Chronic Fatigue Syndrome and Rheumatoid Arthritis:

In most auto-immune diseases there are unique indications that a specific function of the immune system is not working properly. In Chronic Fatigue Syndrome, for example, it appears that the problem lies with the functions of the B cells and T cells as well as the complement system. A damaged immune system lowers the body's ability to fend off infection and cancerous tumors. When the B and T lymphocytes are impaired, the body starts to produce flu-like symptoms that are designed to help fight off infection, such as fever, weight loss, muscle and joint pain, headache and severe fatigue.



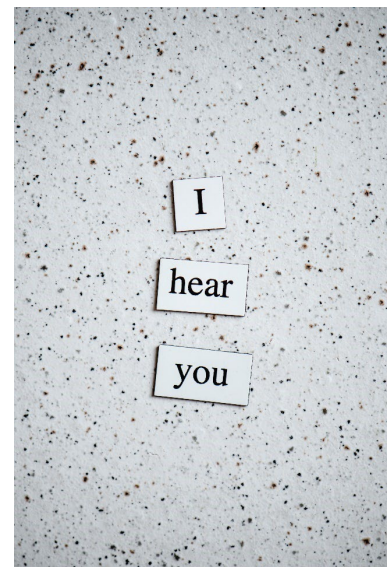
In the case of rheumatoid arthritis (RA), for reasons that are not yet understood in conventional medicine, the immune system launches an all-out attack on the joints. Scientists have found that in RA sufferers, a large number of blood cells (including T cells, which are key immune components) flood into joint cavities. This leads to a cascade of undesirable chemical events that result in the joints becoming painfully inflamed. Often synovial cells begin to multiply out of control, forming a pannus, a mass of tissue that resembles a tumor. Once formed, the pannus secretes destructive enzymes that destroy joint cartilage. Without proper cushioning, bone surfaces begin

to fuse, which restricts motion and causes excruciating pain. This debilitating process eventually damages the ligaments, tendons, and muscles, often leaving the person with a deformed appearance. Because of the immune involvement, RA sufferers also have to cope with flulike symptoms, including fatigue, fever and aching muscles. As a Massage Therapist, you no doubt have clients that have RA or Chronic Fatigue related illnesses. There are many additional therapies you can provide to them (particular massage modalities, therapeutic essential oils, stretching techniques, etc.) that can help them.

How You Can Help Your Clients with Auto-Immune Diseases:

While there is much for scientists to learn about these conditions, what we DO know about auto-immune diseases is that massage therapy has the potential to alleviate many of the painful, debilitating symptoms. When performed by a skilled therapist, massage therapy treatment provides sufferers with much needed relief from chronic pain, stiffness and loss of mobility without the host of risky side effects from pharmaceutical drugs.

To provide meaningful support to sufferers of auto-immune diseases, a better understanding of each person's unique condition is needed. In conversing with your clients, you will often find that their illness was frequently misdiagnosed (perhaps for many years), which prevented the sufferer from receiving the best care for the nature of their illness. If your

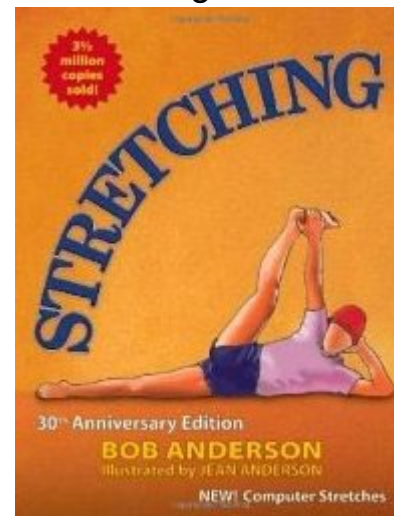


client is still in the early stages of being diagnosed, he or she may be frustrated with the exhausting diagnostic process. Even worse, if the diagnosis is not clear, the client may feel powerless, scared and alone, knowing that the real symptoms they are experiencing cannot be pinpointed to a specific illness.

When a client whom you know is a sufferer of an autoimmune disease sees you for treatment, try to keep in mind that they are coping with loss of freedom, limitations and other changes on a daily basis. Make sure to check in with them at the beginning of each session to find out about their current pain levels or the appearance of any new symptoms. One of the biggest challenges for people with autoimmune illness is coping with the ups and downs of flare ups and relapses.

If your client's illness is impacting his or her ability to perform in their profession, you may be able to work with them to incorporate stretches and release techniques to reduce the pain they experience during their

workday. An excellent addition to every Massage Therapist's professional library is a stretching reference like [Stretching: 30th Anniversary Edition by Bob Anderson](#). This book includes lots of graphic illustrations and stretching exercises. It can be purchased by clicking on the above link.



Using a well illustrated reference book like this one can help you to provide your clients with simple but effective stretches that can be performed at home or at work. Show your client the stretch illustration that relates to their

problem area, demonstrate the technique yourself and then have the client practice the stretch several times until they are comfortable with it. You can help your clients to see longer lasting results by providing them with a customized stretching routine that is suited to their level. You can modify the routine as their flexibility and range of motion improves over time. You can also encourage your clients with auto-immune illnesses to maintain their positive results and reduce flare ups by scheduling frequent and consistent massage therapy sessions.

On a positive note, many people who are diagnosed with autoimmune illness report that receiving meaningful support helps them to cope effectively with the limitations brought on by the disease. Although they are faced with tremendous physical and emotional challenges, receiving care from a skilled and caring therapist can play an important role in helping autoimmune sufferers to manage their symptoms and maintain a hopeful, positive attitude. If you'd like to learn more about how you can help your clients with autoimmune illness, be sure to check out my Chronic Illness class which includes in-depth information for massage therapists in treating chronic pain, osteoarthritis and fibromyalgia.

CHAPTER 3: STRESS - THE IMMUNE SYSTEM'S

SILENT ENEMY

In a healthy person, the immune system operates like a finely tuned machine. Day after day, billions of cells travel throughout the bloodstream, passing through organs and tissues to provide simultaneous defenses against bacteria, viruses and cancer cells.

The immune system also acts as an alarm system during the early development of cancer cells. Using three key functions - physical barriers (like the skin), generalized inflammatory responses due to increased blood flow to an affected area, as well as targeted immune responses



(where the body identifies specific invaders that have attacked previously and destroys them after each subsequent exposure), the body is able to protect itself from would-be attackers and stay in prime working order.

Unfortunately, everyday events that are not life-threatening can trigger a false alarm immune response. If this happens occasionally, the body is able to cope and adapt; however, constant false alarms damage the body's adrenal system and can lead to a host of physical symptoms. Under this type of unrelenting stress, the immune system's ability to fight off antigens is also compromised and makes the person more susceptible to infections. The stress hormone corticosteroid lowers the number of lymphocytes available in the body, which suppresses the effectiveness of the immune system in fighting off attackers.

How Stress Breaks Down Immunity:

A ground-breaking study in 1980s conducted by psychologist Janice Kiecolt-Glaser, PhD, and immunologist Ronald Glaser, PhD, of the Ohio State University College of Medicine made an important link between stress and the outbreak of infection. By studying the stress levels of medical students over a ten-year period, researchers found that the students' immunity dropped each year under the stress of their three-day exam schedule. During this short period of increased stress, blood tests revealed that the medical students had lower levels of natural killer cells, which are used by the immune system to fight off viral infections and tumors. Under stress, immunity-boosting gamma interferon production stopped almost altogether and infection-fighting T-cells were found to be much weaker than normal.



Interestingly, the students were also given questionnaires regarding stress in their personal life and behavioral reactions, such as life events and loneliness. Researchers were interested in finding a psychological link to increased levels of stress. The Kiecolt-Glaser et al study found that in students who described themselves as most lonely, or who were coping with stressful life events and mental illness like depression or anxiety, the immune responses were especially weak.



While under stress of any lasting duration – whether just a few days, a few months or even years (as happens in the lives of many of your massage clients), the study showed that **every** aspect of immunity went downhill.

The take home message from this study: ***Long-term and chronic stress causes excess wear and tear on all of the bodies physiological systems and over time ravages a properly functioning immune system.***

We all know from personal experience that stress and depression can lead to other physical problems like muscle pain, headaches and reduced immunity. However, ongoing studies are revealing more than we ever knew before about the power of the mind-body connection. The Kiecolt-Glaser study emphasizes that there is a psychological link to how the body copes with stress. Ultimately, this means that feelings of isolation, loneliness and stress can be indicators of a person’s long-term health prognosis.

Tracing the Pathways Between Stress and the Immune System:

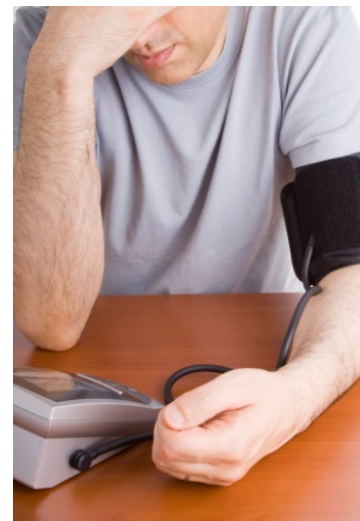
Physiologically speaking, how does stress actually get inside the body and affect immune system responses? Researchers have discovered several “pathways” between stress and the immune system. The immune system was once believed to be autonomous, working completely independently

from the rest of the body. However, research has revealed that this complex network responds to signals from all other body systems. So, when a person is exposed to environmental stimulants that activate the nervous system and endocrine system, the immune system is triggered into action.



Where are these pathways? First, the nervous system has sympathetic fibers that descend from the brain into lymphatic tissues in the lymph nodes, bone marrow, thymus and spleen. These fibers can actually change immune responses by releasing substances that bind to receptors on white blood cells. Different types of lymphocytes (white blood cells) have adrenergic receptors that are highly responsive to this type of stress signal from the brain. Killer cells for instance, have the most sensitive receptors while T cells have among the lowest sensitivity.

Catecholamines are the chemicals produced by the body that work in nerve transmission. The three major catecholamines are dopamine, epinephrine and norepinephrine. Dopamine raises the heart rate and blood pressure, epinephrine raises heart rate and opens blood vessels (which lowers blood pressure), and norepinephrine closes blood vessels (raising blood pressure).



Since epinephrine and norepinephrine increase under stress, they are the catecholamines that are most often measured in studies involving stress. Increases in either of these chemicals can indicate that natural killer cell activity is suppressed, that cells are not being distributed properly or that lymphocytes are being moved from bone marrow to other areas of the body.

Scientists have found an additional pathway for stress to influence the immune system. Changes in behavior when a person is struggling to navigate through a stressful experience can often lead them to engage in harmful activities—such as alcohol, tobacco or drug use or eating disorders. Young people are especially at risk for developing these behaviors. Researchers believe that these activities can severely impair immune system processes. So, when a client you treat is coping with anxiety, encourage them to turn to positive stress-busting techniques like exercise and holistic therapies, adequate rest and healthy eating habits.



As licensed massage therapists, we are not surprised that scientific evidence supports what we as holistic health care practitioners have understood for decades. Using effective stress management techniques, giving priority to our health and developing strong friendships are **essential** ways order to

improve our day-to-day feeling of well-being as well as our long-term health. Understanding exactly how psychology—a person’s mood, outlook and



stress levels—can influence their physical biology helps scientists to learn more about how we can further strengthen and protect our immune systems by taking a holistic approach.

DID YOU KNOW?

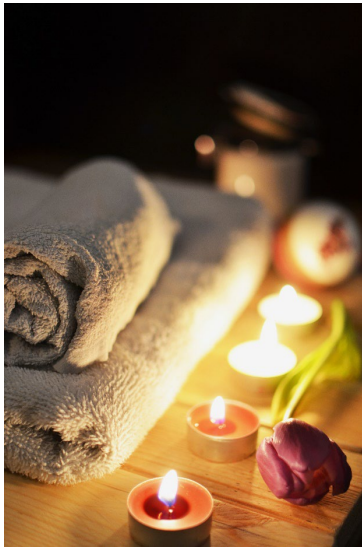
Studies show that the longer a person has to cope with chronic stress, the greater the impact it has on suppressing their immune system. Long term stress has been shown to cause decreases in almost all measurable immune functions. And although the duration of stress plays an important role, the most harmful stressors were ones associated with changes in a person’s identity or social roles. (For example: having to become a full time care-giver for a loved one, suddenly losing a job or the death of a mate.)

Why do scientists believe that these chronic stressors cause so much damage to our immune systems? One reason may be that situations that impact our social roles also tend to be more constant, rather than intermittently present, giving the person little opportunity to rest or care for their personal health and wellness. Additionally, chronic stressors are generally less controllable, which adds to the psychological and physiological impact on a person’s body.

This underscores the importance of massage therapy for individuals who deal with ongoing stress. The deep level of relaxation that massage treatments achieve give the person’s mind and body an important opportunity to rest and rejuvenate. Research has shown that these effects last far beyond the length of the actual treatment. Encourage your clients who cope with chronic stress to schedule regular appointments in order to feel the maximum effect of relaxation massage techniques.

Why are friendships related to immune health?

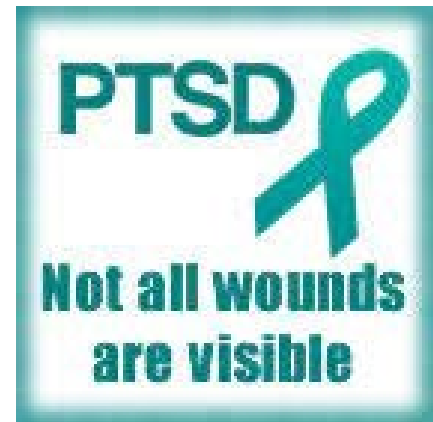
The newest findings underscore the value of close friends. Consider for example, a person who is a full-time caregiver for a mate who is chronically ill. Social connections can help people who are dealing with long-term stress to combat feelings of hopelessness and isolation. Confiding in a friend with a listening ear can help a stressed-out person to avoid feeling completely overwhelmed by their situation. Indirectly, the right group of friends can help to strengthen immunity when they encourage behaviors that are good for our mind and body that we may neglect to do on our own - such as eating healthful food, getting enough rest and relaxation and exercising. When unexpected, stressful life events arise, good friends also help us to stay strong and cope more effectively with the effects of stress.



If you treat a client who has difficulty letting go of stress, you can help by using several relaxation techniques. Remind your client to breathe slowly, deeply and rhythmically throughout the massage. As the therapist, you can implement additional techniques to aid in achieving deep relaxation by using appropriate therapeutic essential oils, hot stone therapy or other modalities you are familiar with. Even the simple step of providing a dark, quiet room with soft music can go a long way in creating a calm and restful environment that will be an oasis for your clients and help them to relax and rejuvenate.

How the Body Responds to Trauma:

Trauma can be any type of life event that affects either the person who experiences an event or someone who witnesses it. Traumatic incidents are overwhelming, terrifying and can be life-threatening. Sometimes a person who has been traumatized will experience symptoms immediately, but others may not show any signs for months or even years.

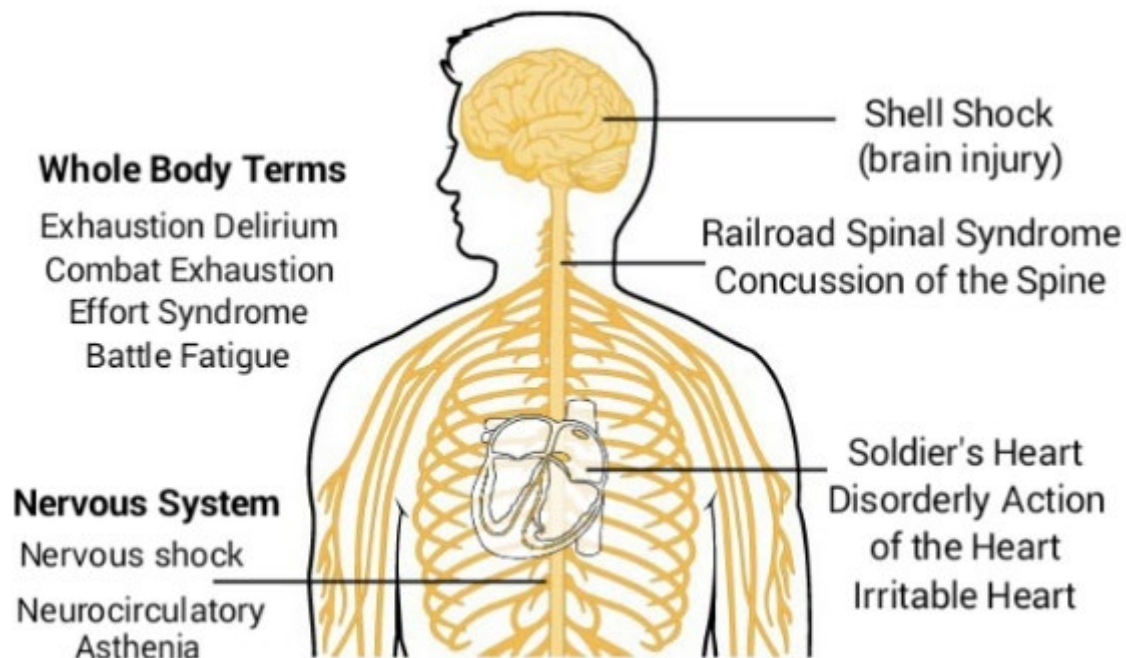


Conditions that arise within one month of a traumatic event are referred to as **Acute Stress Disorder**.

What is PTSD?

Put simply, PTSD is a range of physical, mental and emotional stress symptoms that can completely disrupt a person's life following a traumatic event. While most people who witness or experience trauma recover within a few weeks or experience Acute Stress disorder symptoms, up to 30% of people will experience longer lasting effects that do not disappear with time. Most people who develop PTSD will experience nightmares, frightening "flashbacks" of the event, unexplained anxiety, feelings of numbness or of being distant from others.

Historical Names for Post-Traumatic Stress Disorder



Historically PTSD was believed to be a physical injury that lead to both physical and mental symptoms.

<http://traumadissociation.com/ptsd/history>

What causes PTSD?

Psychologists and other experts have not yet discovered why traumatic experiences affect one person more than another. The two major factors that are known to increase a person's risk of PTSD are a family history of mental illness and lack of support following the trauma to assist in the healing process.

Additionally, the traumatic event itself may be an important factor in whether the person will develop signs of PTSD. Obviously, the more severe a traumatic event, the more likely the person will experience negative feelings.

Experts have found that in cases where trauma is severe and the person received negative reactions or lack of emotional support from friends and family members, that they are more likely to have symptoms of PTSD.

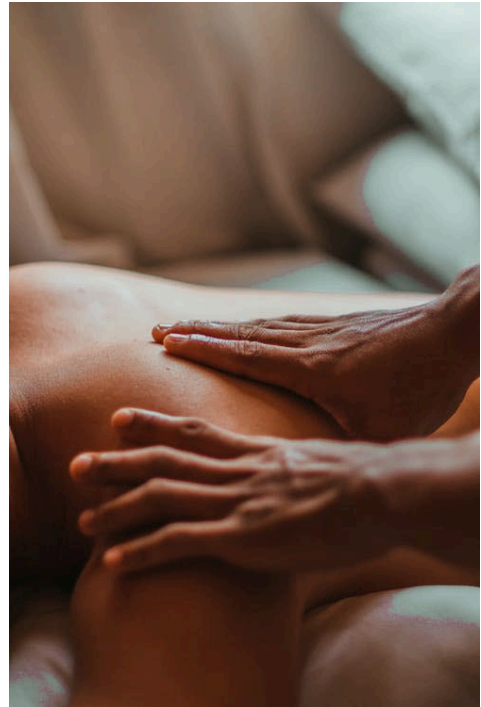
Did you know that the following events are common causes of stress disorders?

- Rape
- Being the victim of abuse or neglect
- Serious accident
- Experiencing or witnessing violence
- Giving birth
- Having an invasive medical procedure or surgery
- Death of a loved one
- Combat exposure
- Captivity
- Natural disasters, such as a flood, hurricane, or earthquake



How Massage Therapy Helps People with PTSD

Physiologically speaking, massage therapy helps to address the long-term effects on a person's sympathetic nervous system (often referred to as the "fight or flight" response). Massage has been proven to lower stress hormone levels, particularly cortisol and norepinephrine (see Chapter 2 regarding the effects of cortisol). Massage also helps people to achieve a state of deep relaxation, allowing the body to increase production of oxytocin and other relaxation hormones. In this state, the mind and body are able to calm themselves and reconnect. And of course, just the fact that a client is in a relaxed state, in a darkened room, listening to soft music and inhaling some aromatic and relaxing essential oils, can also help that person to feel calm!



Special note to therapists: Although massage therapy is one of the most beneficial treatment options available to sufferers of PTSD, therapists should also be aware that touch can reactivate trauma or trigger a sudden flashback. By making yourself aware of the client's condition before beginning a treatment session, you will be able to use approaches that will effectively address the special needs of a person with PTSD. It may also mean that you will need to be willing to work with the client's mental health professional (if the case is severe), who may be able to help guide the healing process according to the client's progress.

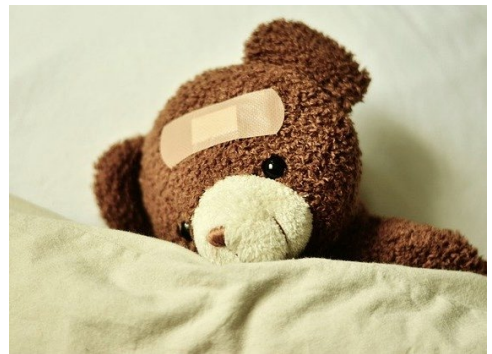
What is a flashback?

When a person is recovering from a violent trauma, it's understandable that seemingly small things can trigger a vivid flashback – whether it's a certain smell, image or touch. The client may suddenly be flooded with terrifying feelings and memories and may even react violently with a powerful outburst of emotion. The client may scream, curl up into the fetal position, tremble or lash out physically.

If a client with PTSD appears to be having a flashback during a massage session, you can help by moving the client to a different position and calmly reminding them who you are, who they are and where you both are until the images they are seeing start to subside and the episode passes. It is VERY important for you to remain calm in the event this happens; your calmness and confidence will help reassure them that they are safe.

Helping Survivors of Sexual Abuse:

Childhood sexual abuse is one of the most common causes of PTSD that you will encounter in your massage therapy practice. While reports vary, experts estimate that one third of all women are victims of sexual abuse. According to RMT Betsy Webb: “Upon entering the field of massage therapy, one expects to treat survivors of sexual abuse, many of whom have PTSD. Of course, most survivors don't



discuss this with their massage therapist. While estimates are controversial, approximately 1 in 4 women and 1 in 6 men [may] have been sexually abused. Therefore, many of the clients who come in are most likely survivors.”



How can a massage therapist provide care for individuals who may or may not disclose their history of abuse? One important way you can help is to create a positive environment for clients dealing with the long-term effects of PTSD following childhood sexual abuse:

- Create a safe atmosphere that enables each client to feel in control of what happens to their body.
- Invite the client to bring a support person with them into the treatment room if possible if it makes them feel more comfortable.
- Include an area on intake forms for clients to list any concerns (either emotional or physical) they may have about the massage treatment.
- Encourage dialogue and engage the client in each step of the process. Invite them to give feedback or to signal when they would like to stop or have a short break.

- For clients who are prone to flashbacks while lying down, adjust the massage table to a position where they feel in control and are able to maintain visual contact with you throughout the treatment session. If you don't have an adjustable table, try to use pillows or bolsters to put them in a different position so they are more comfortable and feel secure.



DID YOU KNOW?

According to a 2005 study published by the Journal of Alternative and Complementary Medicine, massage therapy can play an important role for clients who have experienced severe trauma or childhood sexual abuse.

Participants with a history of sexual abuse as well as signs of PTSD and depression were given a series of massage, healing touch or acupuncture treatments. At the conclusion of the study, the recipients were asked to describe their perceived changes in four key areas of trauma recovery: bodily sensation, body image (feelings of shame), personal boundaries, and perceived personal safety.

The clients reported positive outcomes in all aspects of recovery as well as high levels of satisfaction with the treatments. Mental health clinicians supported these findings, reporting enhanced psychotherapeutic responses. Studies like these give even more evidence that integrating massage therapy into mental health care programs for conditions like PTSD can improve recovery and quality of life for people dealing with the long-term effects of trauma.



No matter what the cause, treating a client who suffers from PTSD calls for the therapist to be sensitive, responsive and willing to allow the client to steer the process when necessary. By offering a safe environment where your client feels that they are in control of what

happens to their body, you can help them to begin to heal from the difficult symptoms of PTSD.

Remember that sufferers of this disorder will often avoid help as they try to put off dealing with the negative feelings associated with the traumatic event. You may even encounter clients who don't know that the illness exists or who are not aware of the treatment options available. In instances like these, make sure you educate your clients about the knowledge that you have about PTSD and be sure to encourage them to seek professional help and refer them to specialists in your area if possible.

CHAPTER 5: DIET & LIFESTYLE – MAKING THE BEST CHOICES TO COMBAT STRESS

The evidence is abundantly clear that a healthy immune system is essential to a long, healthy and satisfying life! We've discussed in detail the ravaging effects of stress on the body, but it's important to consider practical ways to



combat stress and improve the immune system. Learning these strategies will benefit you as you cope with stress in your own life, and it will also equip you to share valuable information with your massage clients.

While there is no simple way to strengthen a properly functioning immune system, there are things you can do to bolster your immune defenses when infections or serious illness arise. The three essential areas are: a healthful diet and nutrition, regular exercise and implementing stress reduction techniques.

A Healthful Diet:

When it comes to immune function, the two major improvements most people can make to their diet are to increase their intake of antioxidants and ensuring that the diet contains an appropriate balance of nutrients and micronutrients.

Antioxidants are vitamins and minerals that help to remove damaging free radicals or oxidants from the bloodstream. Free radicals are naturally occurring byproducts in the body that come from the process of turning food into energy. However, our environment is also full of more harmful oxidants that are byproducts of pollution, UV exposure and cigarette smoke. Why are they so dangerous? Free radicals damage the DNA, suppress the body's immune system, contribute to heart disease and atherosclerosis and according to recent studies, play an important role in several types of cancer.

While we cannot eliminate our exposure to free radicals completely, it's wise



to take steps to eliminate any possible environmental factors and increase your intake of antioxidants with a diet that consists mainly of fresh, colorful and organic fruits and vegetables.

Unfortunately, no matter how well you eat, in my professional opinion, it will always be necessary to take nutritional supplements. Although we might always try to eat well, the bottom line is we still cannot ALWAYS eat perfectly 100% of the time. Organic foods are not always available, which means we are constantly going to be exposed to pesticides and other chemicals. Over time, with continual exposure, this will weaken our immune system and can only add to the levels of stress in our bodies. Being responsible and proactive with our



health, means we must take nutritional supplements to help offset these contaminants. Supplementation will also help to strengthen our immune system and lessen the impact of free radicals. Be sure when deciding to take supplementation that you opt for *whole food supplements*. These are made from foods and herbs. Typically, over the counter “vitamins” are isolated and synthetic vitamins. This means they typically are chemically produced in a lab and do not come from whole foods. These are inferior and not fit for human consumption. Be sure to read the labels on nutritional supplements and look for whole foods or herbs to be listed in the ingredients label. If you get overwhelmed at all the different types of supplements available, be sure you engage the help of a qualified natural health care provider that can best help you.

Nutrients and micronutrients:

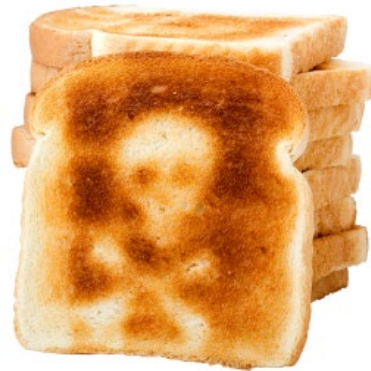
It only takes a slight nutrient deficiency in the diet to weaken the immune system. A gradual loss in the body’s vitamin stores over months or years can often lead to a general lack of well-being and a reduced ability to fight off disease and infection.

The typical American diet is sorely lacking in essential nutrients, especially those that come from fresh fruits and vegetables and lean *pasture-fed* meats. I made the point about pasture-fed meats because it is very important to know that most meat in the grocery store comes from animals that are confined to feed lots of CAFO's (concentrated animal feeding operations). These animals are mostly fed genetically modified corn and soy products. Please know that these foods are not natural to the animal. Cows are meant to graze on grass; not eat corn. So, when we eat their meat, we are getting an inferior product and too much of a type of fat called Omega 6. When cows graze on grass, as they are supposed to, and we eat their meat, we get the healthy Omega 3's. So, when possible, try to purchase grass-fed beef.



Also, it is important to try to incorporate more fruits and vegetables into your meals by adding something new each week to your shopping cart. I encourage my clients to try a new vegetable each week. There are LOTS of recipes online that you can use to experiment with new veggies. Green leafy vegetables such as broccoli, kale and watercress are delicious and are very rich in antioxidants. These foods in particular work great in stir-fry's so don't be afraid to experiment!

Instead of consuming wholesome, nutrient dense foods, most Americans have developed the tendency to overdose on refined carbohydrates, which is one of the main culprits in the obesity epidemic that the US is facing. The body



handles carbs like bread and pasta, just like sugar, so when a person consumes too many carbohydrates, the pancreas becomes overworked, and their blood sugar becomes dysregulated. Blood sugar imbalances negatively impact a person's stress levels by causing symptoms like sleep disruption, inability to focus and nervous system overload, which further aggravates an already tired-out immune system. Over time, chronic overconsumption of carbohydrates can even lead to serious illnesses like Diabetes and Metabolic Syndrome.

In my experience, most people are consuming WAY too many carbohydrates (pasta, bread, rice and other grains). This is putting added stress on their body because the pancreas is being overworked. Certainly, this results in physical problems (like the illnesses mentioned above), but when the body is trying to deal with so much sugar, it also has an effect on the person's emotional health as well. Most clients I see that are "stressed out" have anxiety, anger issues, depression, don't sleep and have hormonal imbalances. All of these symptoms can be avoided with proper dietary changes.

If you are very motivated to improve your nutritional habits, why not take a closer look at your weekly diet by keeping a food log? I recommend to my

clients to use [My Fitness Pal](#) which is an online dietary and exercise journal. It's a wonderful tool (apps for smart phones & iPads too!) to use to help you maintain your diet. You can also share with friends to help keep each other on track! Keeping track of your food intake, will help you to monitor what you're eating. You may be surprised to see how many times per week you eat foods that make it difficult for your immune system to function optimally (like fast foods and sodas!). Foods that are high in saturated fat, like deep fried foods, as well as white, processed carbohydrates are ones to especially avoid. If you're looking for a protein-rich meal, a healthier alternative to red meat is wild-caught salmon (be sure to not buy farm-raised), which is rich in omega-3 fatty acids. Boosting your cold-water fish intake will reduce inflammation in the body and improve immune function. A good quality, whole-food vitamin and mineral supplement can also help to protect us against micronutrient deficiencies and fill in the nutritional gaps when we are not able to eat as well as we would like to.

11 Simple Ways to Reduce Stress:

- Give your body the rest it needs each day (At least 6-8 hours of sleep per night.)
- Make time for a healthy, reasonable diet. Avoid skipping meals or overeating and eating too many carbohydrates. Include lots of vegetables in your diet (not corn or potatoes!).
- Build exercise into your day by taking the stairs or going for a brisk walk during a lunch break.
- Spend more time enjoying life with close friends and family.
- Know your own physical and emotional limitations.
- Delegate or share tasks at work and at home to limit the physical demands on your body.
- Don't bottle up your feelings. If something is worrying you, talk to a trusted friend.
- Set realistic goals; do not be a perfectionist. Maintain a reasonable schedule.
- Be organized! Avoid the stress of misplaced items and scheduling errors.
- Cultivate good qualities such as mildness, patience and open-mindedness.
- Create a daily ritual where you set aside some quiet time for yourself. Take a 5-minute mental vacation by visualizing a favorite destination or activity. Add visual cues to your workspace like vacation photos to help remind you to do this daily.



More Ways to Keep Stress Under Control:

The simple step of setting aside some quiet time for yourself can do wonders for your immune system. Develop a ritual each morning or before bed where you can spend just a few minutes enjoying a cup of tea, reading a favorite book or praying and meditating in peace. Making appropriate lifestyle changes in these areas will strengthen the immune system and help you to achieve your optimum health.



A book on parenting advises, “When you spend some of your valuable time and energy on yourself, you are, in essence, filling your personal-resource bank. Constantly giving means that you’ve got to be sure there’s something going back in as well, or you’ll risk becoming emotionally short-changed, if not actually bankrupt.”



Women are at especially high risk of finding themselves emotionally bankrupt from the constant juggling act of caring for their families, spouses and communities, all while balancing the demands of a career. When a person lives this way for months or years on end without taking time out for themselves to rest and recharge, they may start to feel the signs of burnout, depression or loss of health. If you notice this tendency in one of your clients, you can encourage them to upgrade their wellness by booking a standing massage appointment at regular intervals to

help them to build relaxation and “me time” into their demanding schedule.

Leading by Example When it Comes to Your Health:

As therapists, we need to keep in mind that it is not our role to provide counseling or medical advice to our massage clients. However, setting a good example and then sharing your personal experience about the benefits you feel will help your clients to see that achieving wellness is an achievable goal that is within each person’s control. If you think a client could benefit from additional nutritional or health counseling, be sure to refer them to a qualified natural health practitioner.

IN CONCLUSION

One of the most dangerous and insidious problems associated with stress is the daily wear and tear that goes unrecognized and untreated. When a person denies the problem or feels they lack the time and resources to deal with the issues, chronic stressors can lead to the illnesses we've discussed in this e-book.

As massage therapists, there is so much we can do to help our clients to get on the road to recovery from stress overload. Make sure to share what you've learned in this class with your clients - from the relaxation techniques to regular massage sessions that incorporate music and aromatherapy, to personalized stretching routines, healthy eating and exercise. All of these options can have a tremendous impact on a person's physical and emotional wellness.

Stress will always be inescapable. But by leading by example and helping your clients to adopt more positive coping strategies, we can help ourselves and the people we treat to find a calmer, happier and healthier way of life.





In summary, I hope you now have an appreciation for how important it is to control our level of stress so we don't end up with immune system problems. This knowledge will be beneficial for not only you and your family, but your clients as well. Don't be afraid to share this information with them. We all are involved in the natural healing field to help other people and to promote health in a natural environment. Educating people about stress and how it affects our immune system is key to help them live the best life possible!



THANK YOU for taking this e-book class. I hope you found this e-book class to be informative and helpful. I am available to offer support to you, so please don't hesitate to get in contact with me if you have any questions!





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Edmund J. Bourne, PhD