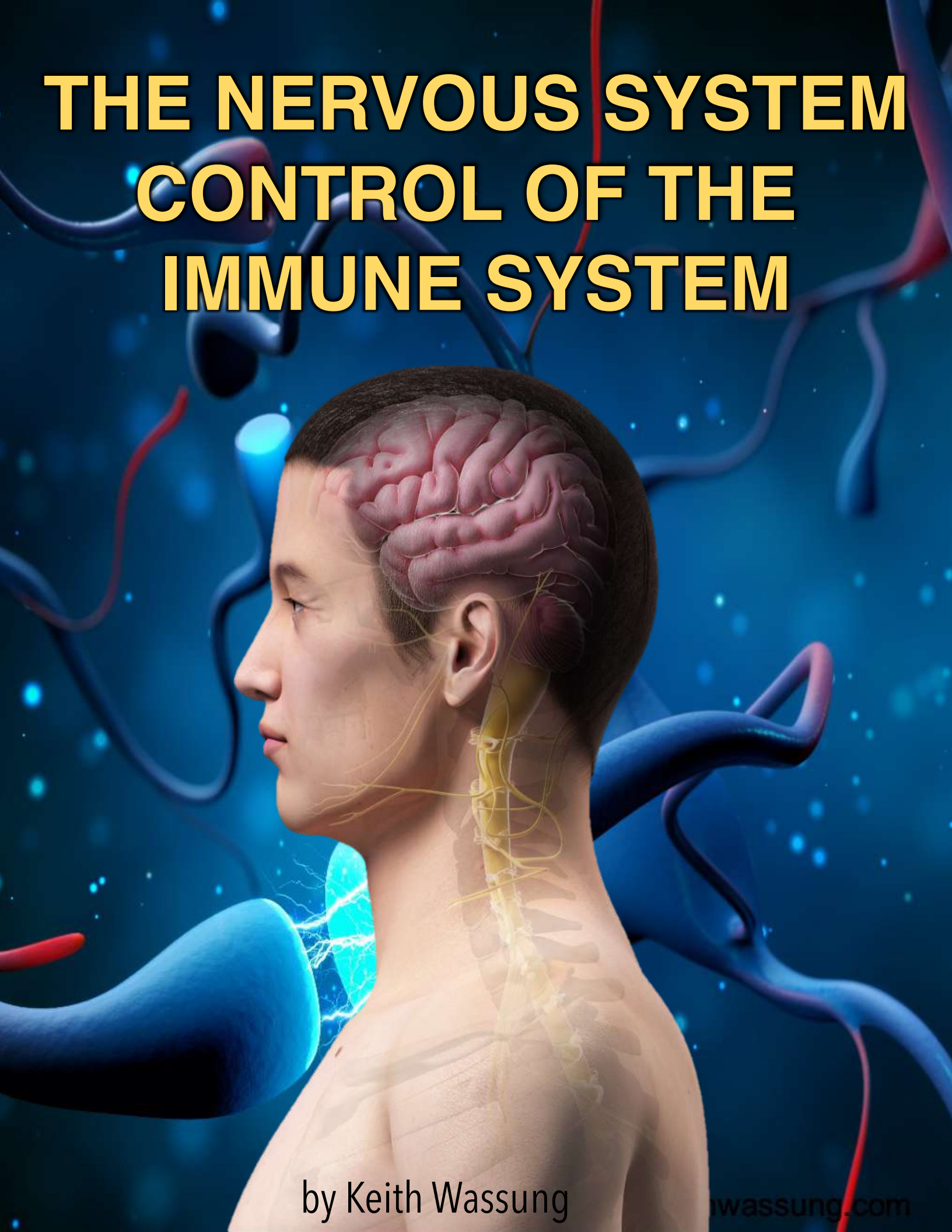
# THE NERVOUS SYSTEM CONTROL OF THE IMMUNE SYSTEM



by Keith Wassung

**T**he past 20 years of health science and research has seen a tremendous increase in the knowledge and understanding of the human immune system, mostly due to cancer and AIDS research. The findings have completely changed our approach to health care as we slowly change from a disease/symptom model to one in which the function and communication of the immune system is optimized.

## A NEW APPROACH TO IMMUNITY

"The inability of antibiotics to wipe out disease entirely and the emergence of antibiotic resistant bacteria and super infections have led many distinguished researchers and physicians to conclude that the answer to disease is not to create stronger medicines. Rather, we say the solution lies in attacking the disease from the inside out by strengthening the body's natural defense network." [1]

**Dr. Robert Roundtree, Immunotics**

## IMMUNE SYSTEM FUNDAMENTALS

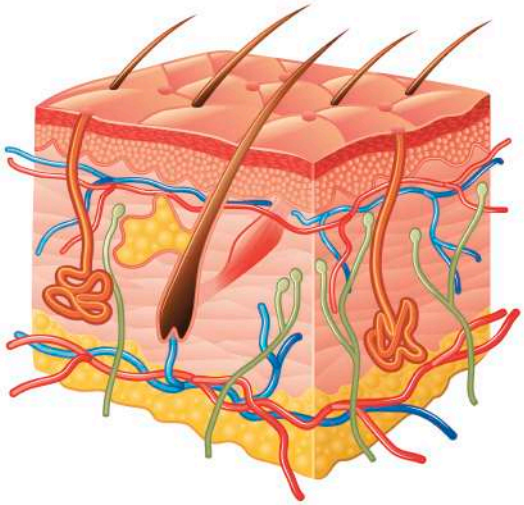
Our bodies are constantly under attack from foreign invaders such as environmental toxins, pollutants, bacteria, germs and viruses.

The immune system is our body's natural defense against these attackers. The immune system is made up of organs, structures and white blood cells whose job it is to identify and destroy disease causing organisms such as bacteria, viruses, fungi, parasites and even the body's own cells that have malfunctioned.

The immune system is divided into two components**, non-specific** and **specific**. The breakdown is for classification purposes only as there is a constant and complex interaction, coordination and communication between all parts of the immune system.

**Non-Specific**: also referred to as innate or non-adaptive. They are generally able to distinguish foreign antigens, but are unable to recognize specific invaders. They will respond to a foreign antigen in the same manner, despite repeated exposures.

They do not adapt and improve their effectiveness against previously encountered antigens. Non-specific components include:



**Physical Barriers**: skin, mucosa, stomach acid

**Chemical Agents**: lysozymes complement

**Effector Cells:** macrophages, natural killer cells

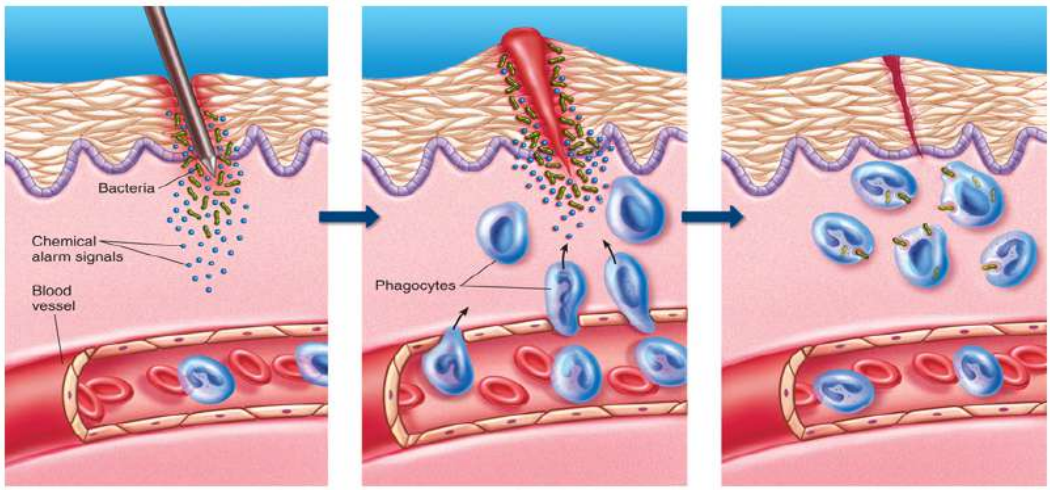
**Specific:** also referred to as acquired immunity or adaptive. Is able to distinguish foreign cells from self-cells and can distinguish one foreign antigen from another. Acquired immunity cells have mechanisms for selecting a precisely defined target and for remembering the specific antigen so that subsequent exposures will result in a more effective and efficient response.

**Components of the specific system are broken down into 2 categories, humoral and cell mediated.**

**Humoral**: are the B cells, which differentiate into plasma cells, which then produce antibodies. B cells require the assistance of macrophages, T cells, and sometimes complement in order to destroy foreign antigens.

**Cell Mediated**: does not involve antibodies but rather involves the production of specific T lymphocytes or T cells. Cell mediated is directed primarily against antigens embedded in the membrane of cells. It is most effective in removing virus-infected cells, but it also assists B cells in defending against fungi, intracellular bacteria and protozoan.

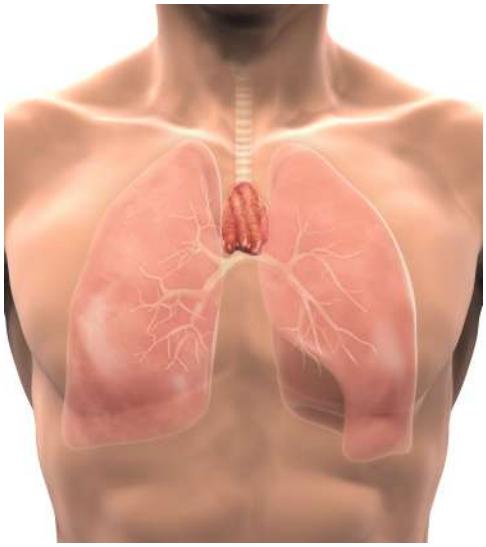
Cellular immunity protects the body by causing activation of antigen-specific cytotoxic T cells which destroy body cells displaying epitopes of foreign antigen on their surface; and by stimulating cells to secrete a variety of cytokines which influence the function of other cells involved in the immune and inflammatory process.




When tissue injury occurs, whether caused by bacteria, trauma, chemicals or heat, multiple substances, such as bradykinin, histamine, prostaglandins and seratonin are released which allow the central nervous system to control and cordinate the healing and repair of the affected tissue.

This process is called inflammation and it strongly activates the macrophages system to begin to remove the damaged tissue and antigens. Inflammation is a vital part of the healing process and when it is delayed or inhibited, healing is incomplete.

## Thymus and T cell function



The thymus is a small, ductless gland, located in the anterior section of the chest cavity.

The thymus consists of two lobes that are connected by aeroler tissue. It is a primary lymphoid organ, and it often referred to as the "master gland of the immune system."

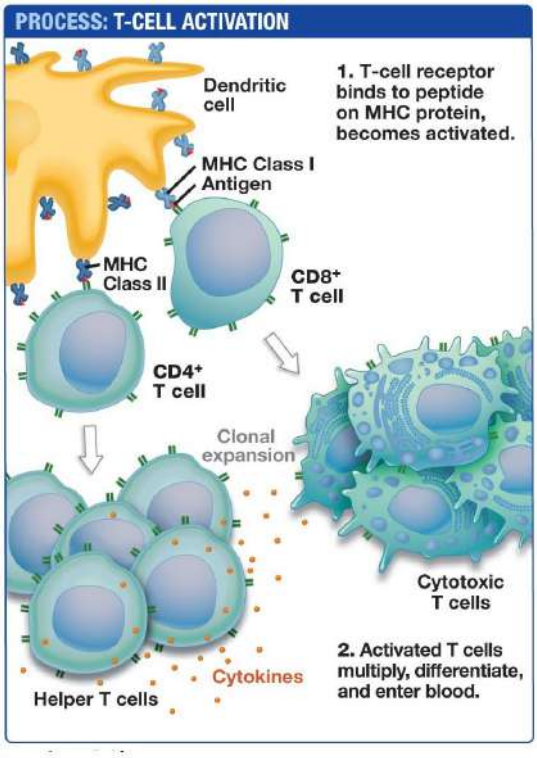
In the thymus, lymphoid cells undergo a process of maturation and selection prior to being released into the circulation of the immune system. This process allows T cells to develop self-tolerance (distinguishing self from non-self).

While developing in the thymus gland, any T cell that reacts to the thymus's major histocompatibility complex (MHC) is eliminated. It is estimated that anywhere from 95-99% of all T cells are eliminated during this process. T cells that tolerate the MHC are allowed to mature and leave the thymus where they circulate in blood and lymph.

The entire repertoire of T cells is approximately $10^{16}$ with each T cell having as many as 100,000 receptor sites on its surface. T cells are classified as cytotoxic or killer T cells, suppressor T cells, and helper T cells, which are further, classified as Th1 and Th2 helper T cells. The proper balance and ratio of these various T cells are critically important in maintaining proper immunological function.

"The thymus derived lymphocytes or T cells are pivotal to the control and homeostasis of the immune system." [2]

**QMC~ Institute of Infection and Immunity**



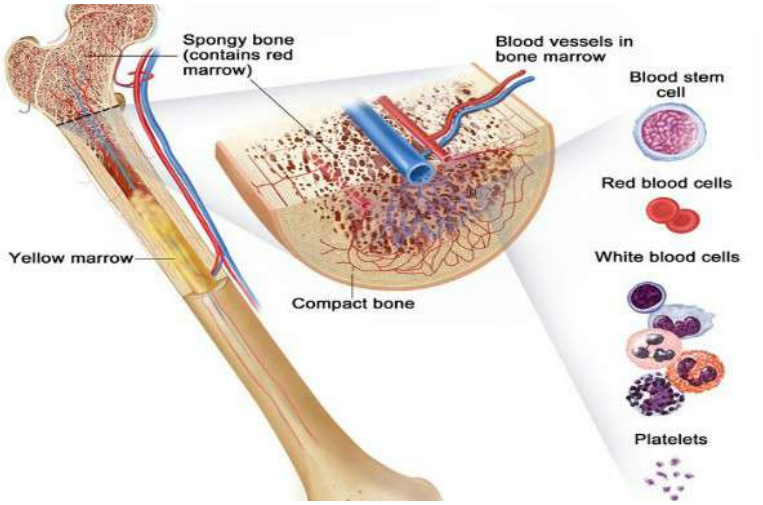

Although the thymus has historically been thought to only serve a purpose early in life, a growing body of research is clearly demonstrating that the thymus serves many purposes throughout life.

"Traditional approach has always maintained that the thymus is only functional in the early part of a person's life and atrophies and remains inert following puberty, but new research clearly shows that the thymus gland plays a lifelong role in immune function." [3]

**Nature**

## Have we underestimated the importance of the thymus in humans?

Recent immunological research has concentrated on the complex and subtle interactions between T cells, B cells and accessory cells. In these studies, little attention has been given to the adult thymus gland.




Modern textbooks of disease and anatomy all stress that the gland undergoes fatty involution with age in man, but omit reference to the statements here and there in the literature that the gland is active and produces lymphocytes throughout life.

To suggest that bone marrow, which also builds up fat throughout life, is atrophic and not important to adults, we would have to deny all modern hematological concepts.

*"***Yet few people take a parallel view of the thymus except perhaps those investigating aging and thymic hormones, in both of these areas of research it is obvious that the thymus must be active throughout life for continued health."** [4]

National Library of Medicine

"It has been estimated that complete thymic atrophy would not occur until the age of 120 years and there is evidence to suggest that even in the very old, sufficient thymic function may be retained to allow for native T cell differentiation." [5]

**Frontiers in Bioscience**

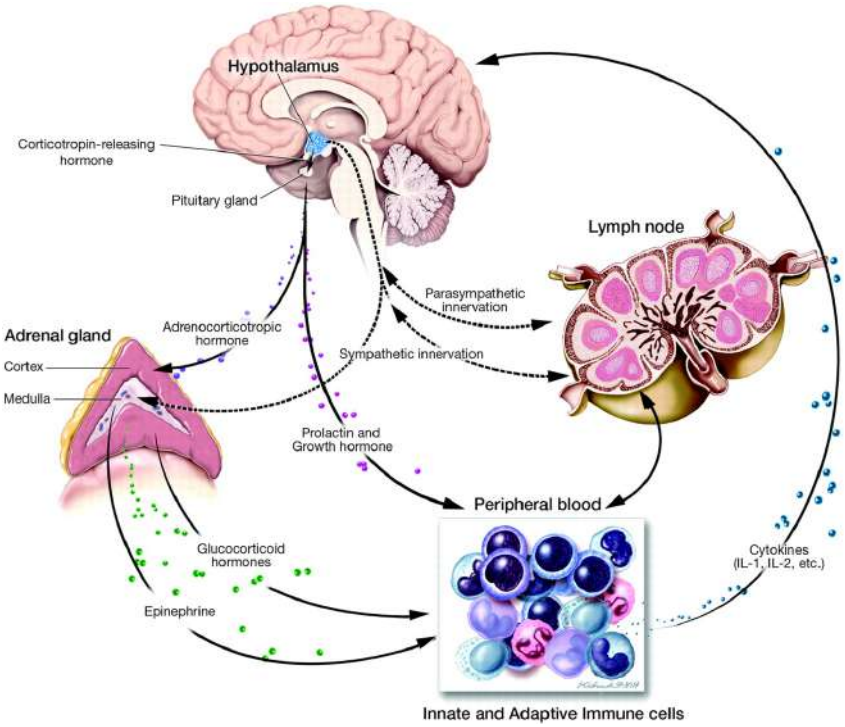
Research has discovered that the thymus gland produces a variety of hormones. Since 1990, several different peptide hormones naturally secreted by the thymus gland have been discovered and clinically tested. These include the Thymosins, a group of 40 related peptides, Thymopotein and Thymulin. Collectively, these thymus gland hormones have been shown to have a broad range of action, well beyond maturing and differentiating T cells, including:

- increasing key immune signals called lymphokines or cytokines.
- causing greater number of T cells to develop IL-2 receptors more rapidly.
- increasing rapid white blood cell proliferation and activation.
- preventing tissue wasting that occurs with thymus gland atrophy.
- reduces and controls autoimmune reactions.
- preventing bone marrow injury and blood cells reduction following cancer treatments.
- increasing disease fighting antibodies, yet reducing the level of "allergic antibodies".

**These are just some of the many ways that thymus gland hormones have been shown to enhance, balance and restore immune system competence.**

## Central Nervous System & Immune System

Neuro-endocrino-immunology is a point of intersection in the field of immunology. It is also referred to in scientific literature as psychoneuroimmunology. The emerging concept is that the cells of the immune system and inflammatory systems communicate directly with the peripheral and or central nervous system.

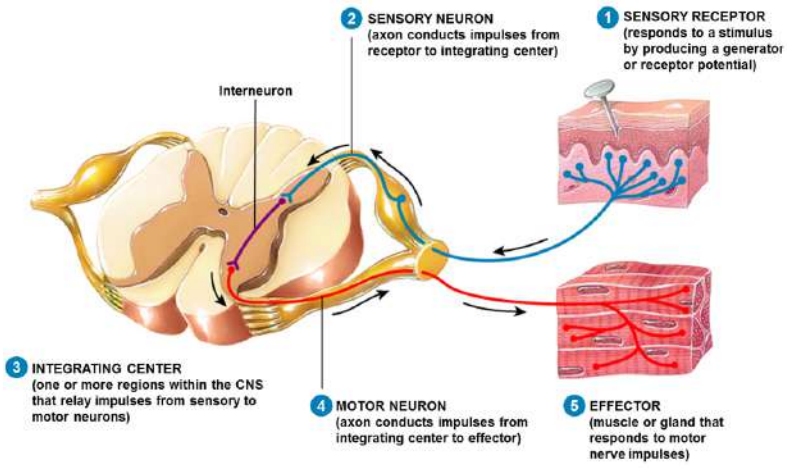



This connection or communication pathway is also mediated via the bloodstream, and therefore involves hormonal communication. The term hormone not only signifies classical endocrine systems, but also molecules released by the nervous and immune systems which have functional effects from some distance.

Thus, the brain and the nervous system are part of a neuroimmuno-regulatory network in which each of the various components not only communicate with each other, but also regulate additional sites in the body.

There are two main pathways that connect the brain and the immune system, namely the autonomic nervous system, (made up of the sympathetic and parasympathetic components), and the hypothalamic-pituitary-adrenal-axis (HPA). In order for the two systems to influence one another, they must have a mechanism by which to communicate. The main type of communication is mediated by chemical messengers which are released by nerve cells, endocrine organs and immune cells.

The immune system is composed of lymphoid tissues, and the fact that these tissues are innervated with sympathetic nerve fibers adds support to the evidence that the central nervous system directly influences immune function. Not only do nerve fibers form neuro-effector junctions with lymphocytes and macrophages, but certain neurotransmitters secreted from these nerves are able to have effects on distant blood cells.



The nervous system affects the immune system both directly and indirectly. The direct effect is via the synapsing of neurons with white blood cells in lymphoid tissues, while the indirect effect is through blood-borne neurotransmitters and hormones, which activate receptors on the white blood cells surface.

"Vertebrates achieve internal homeostasis during infection or injury by balancing the activities of pro-inflammatory and anti-inflammatory pathways. Endotoxins, produced by all gram negative bacteria, activate macrophages to release cytokines that are potentially lethal. The central nervous system regulates systemic inflammatory responses to endotoxin through humoral mechanisms. Activation of afferent vagus nerve fibers by endotoxins or cytokines stimulates hypothalamic-pituitary-adrenal axis responses." [6]

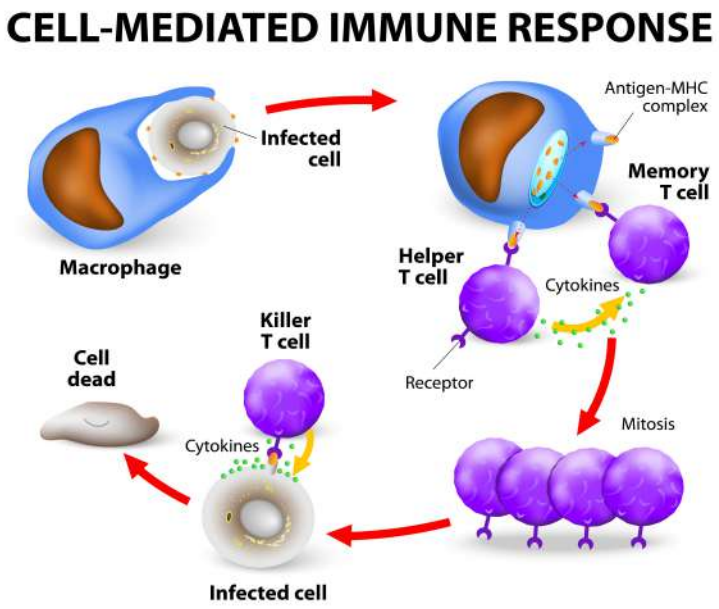
**Nature**

## CNS REGULATION OF T CELL ACTIVITY

Anatomically, all of the lymphoid organs are innervated and there is a regular pattern of close spatial relationships between nerve fibers and T lymphocytes, mast cells and macrophages.

In addition, specific receptors for several neurotransmitters have been detected on T cells, B cells, and monocytes. Thus, the nervous system is able to:

- Induce T cell function, including cytokine secretion, proliferation, integrin-mediated adhesion and migration.
- Modify T cell membrane potential and thereby affecting the gating of specific voltage gated channels.
- Modulate antigen driven, CR mediated, T cell function.



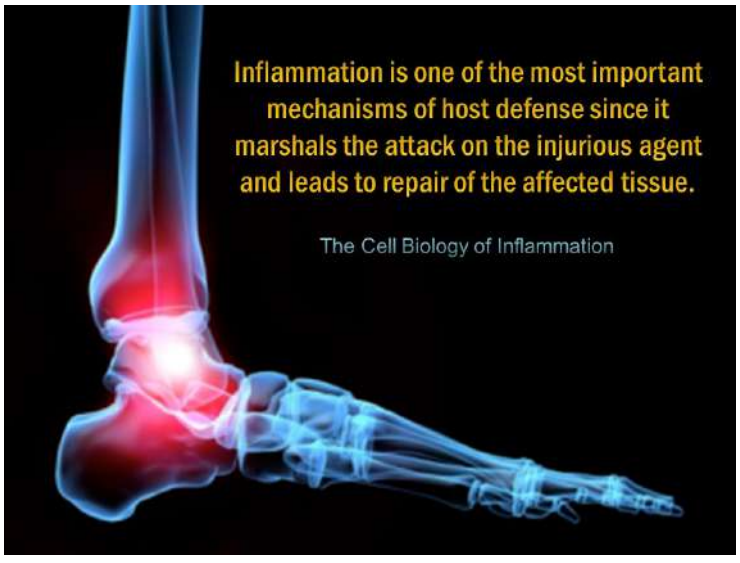

"Collectively, the available data indicates that a complex network of interactions between neurons and T cells is involved in determining the balance between Th1 and Th2 regulating signals, which affects the outcome of the immune response." [7]

**IMMUNOLOGY TODAY**

## Basic studies shed light on immune function

Immunologists at Oregon State University have recently uncovered some important clues as to how the immune system works at a fundamental level. The key, scientists say, is understanding how some of the T cells, which are sort of the quarterback of the immune system that directs other cells to go do their dirty work, can get stimulated to do their work even better, or tone it down in the case of an autoimmune conditions.

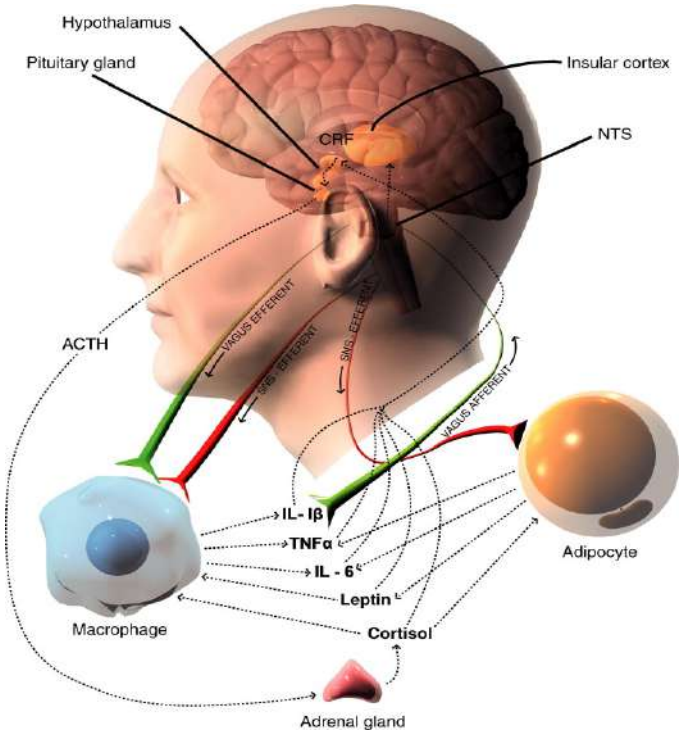
One of the things that have intrigued scientists is the apparent correlation between inflammation and a dysfunctional immune response, especially with autoimmune diseases. Steroid treatments, for instance, which have strong anti-inflammatory effects, are often used to treat autoimmune disorders. "But using a powerful steroid drug, which can have many side effects, to indirectly affect something as delicate as the immune system is like hitting an ant with a sledgehammer", according to Anthony Vella, an assistant professor of microbiology at OSU. "What we have tried to identify is exactly how the process of inflammation is related to immune function and what cellular processes are involved." In one recent breakthrough, the OSU research program determined that inflammation in conjunction with the activation of other T cell stimulatory molecules can help T cell growth and increase the number of "fighting" T cells. In experiments, OSU researchers showed that injecting mice with an antigen caused significant death of the antigen-responsive T cells; however, when inflammation was present, it prevented the death of these cells. In cell membranes of certain bacteria, there is a natural bacterial lipid called lipopolysaccharide, or LPS. It appears that LPS can play a role in causing inflammation, and keeping activated T cells alive. OSU researchers have also shown that the LPS inflammatory signal, which prevents T cell death, is dependent upon IL-1 and TNF stimulation of IL-6. This result is of interest beyond immunology, since IL-6 is a major factor involved in neurological function. Vella speculates that there may be a potential link between nervous system and T cell survival. [8]




**OSU- Immunology Research Dept.**

# CYTOKINES: chemical messengers

Cytokines, also known as lymphokines, are low-molecular weight proteins that are involved in communication between cells. Their purpose is to induce or regulate various immune or inflammatory responses. Immune system disorders may occur if cytokine production or regulation is impaired.




**There are four major categories of cytokines:**

**Interferons**, so named because they interfere with replication. The major types of interferon are: Interferon Alpha (IFNa) Interferon Beta (IFNb) Interferon Gamma (IFNg)

**Colony Stimulating** Factors (CSF), support the growth and differentiation of various elements including the bone marrow which regulates the differentiation of bone marrow stem cells.

**Tumor Necrosis Factor** (TNF), plays a major role in inflammatory response and cell apoptosis.

**Interleukins**, which is the largest group of cytokines and are so named because their fundamental function is the inter communication between various populations of white blood cells.

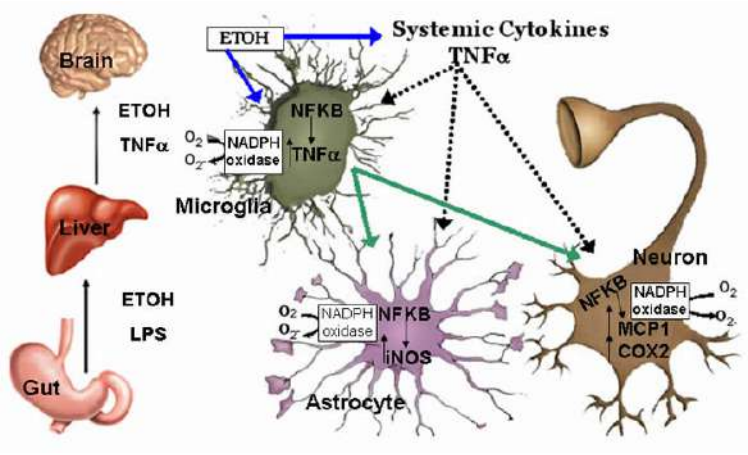
The range of cytokine effects have found to be far wider with the recent discovery of small proteins that influence the migration of cells and attract them to the sites where they are needed.

This process is called chemotaxis; the cytokines that emanate from sites of damage to bring in these cells are the chemokines.

"In the absence of cytokines for the helper T cells, the remainder of the immune system is almost paralyzed." [9]

**Guyton's Anatomy and Physiology**

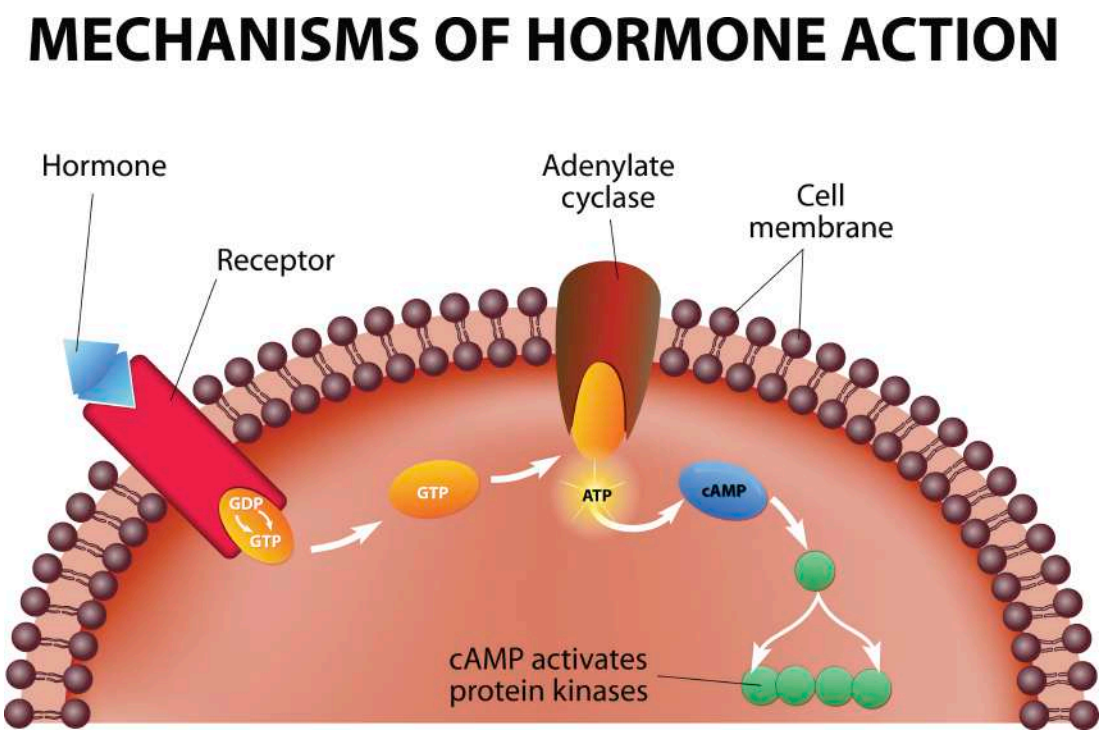
The importance of the cytokines in the host response to injury, invasion and infection can scarcely be overstated. Without them, the body's ability to fight off pathogens, repair damage, and maintain health would be seriously impaired and far less effective. Full protection against disease, injury, and even the normal wear and tear of living requires the participation of many different bodily systems. <u>It is the cytokines that orchestrate, coordinate and integrate them.</u>



## Cytokines as bridges that connect the brain and the immune system.

“On the basis of our present knowledge, it can be proposed that at least three main pathways exist connecting the brain and the immune system: humoral, neural, and endocrine. Cytokines, soluble transmitters, once considered specific to the immune system, do act and can be produced by the central nervous system and represents a common chemical language between the two systems.” [10]

**Institute of Molecular Biology**




"No one could survive without precise signaling in cells. The body functions properly only because the cells constantly communicate with each other." [11]

**Scientific American**

The immune system is so complex in its relationship to organs, glands, and cells that immune dysfunction and immune suppression can create a drastic negative effect on the entire health and homeostasis of the body.

The thymus gland and T cell function play such a pivotal and important role in generating and regulating immune response that a deficiency or imbalance in their function will cause immune system dysfunction or suppression to occur.

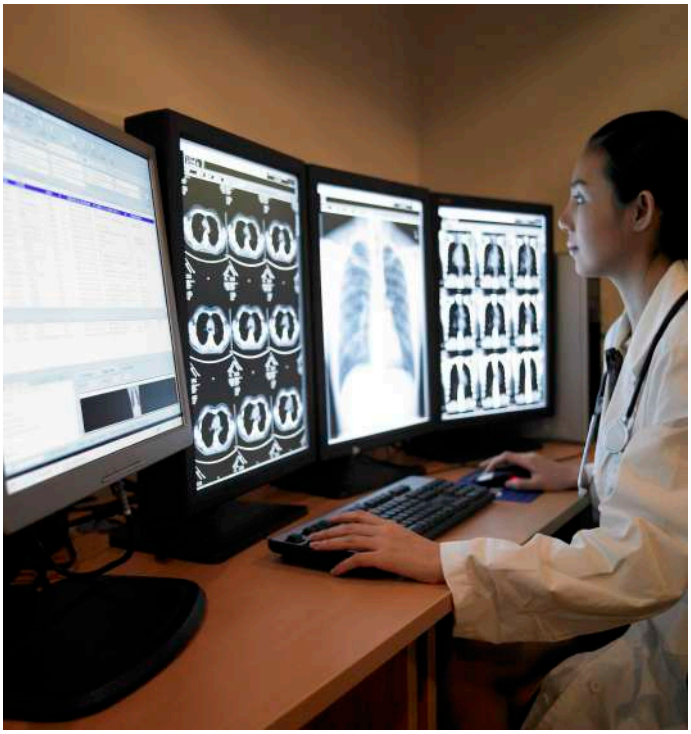
# Researchers Find Textbook-Altering Link Between Brain, Immune System

In a stunning discovery that overturns decades of textbook teaching, researchers at the University of Virginia School of Medicine have determined that the brain is directly connected to the immune system by vessels previously thought not to exist.

That such vessels could have escaped detection when the lymphatic system has been so thoroughly mapped throughout the body is surprising on its own, but the true significance of the discovery lies in the effects it could have on the study and treatment of neurological diseases ranging from autism to Alzheimer’s disease to multiple sclerosis.

# IMMUNE SYSTEM DYSFUNCTION

**There are some sixty-five million Americans who suffer from a dysfunctioning immune system and the number is growing at a rapid rate.**



Much of the increase has been due to the aggressive and invasive approach of treating symptoms with medication, as opposed to restoring and maintaining the proper function of the immune system. Among the manifestations of immune disorders include

Autoimmune, in which the cells of the immune system confuse normal body cells with foreign antigens and attack them. Autoimmune disorders include: rheumatoid arthritis, asthma, allergies, lupus, diabetes and multiple sclerosis.

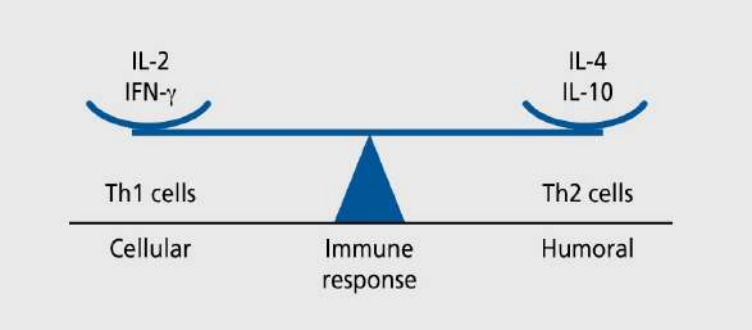
Immunodeficiency disorders are characterized by a weak immune system response and are often associated with chronic infections. They include Epstein-Barr, AIDS, viral infections, otitis media, and even cancer may result from immune suppression.

The cause of autoimmune and immunodeficiency disease has yet to be completely understood, and it is likely that a variety of factors are involved. But a growing number of researchers, including the 1999 Nobel Prize winner in medicine, Dr. Gunter Blobel, are looking at a breakdown in the cell to cell communication of the immune and nervous system to be a leading contributor of immune system dysfunction.

**Alteration in cell death pathway sheds light on autoimmune disease.**

A cells ability to commit suicide, a process scientists call "apoptosis", is an important feature that the body uses to prevent overgrowth of cells and to get rid of cells that it no longer needs .The National Institute of Allergy and Infectious Disease (NIAID) researchers describe a mutation in immune system cells in patients with autoimmune lymphoproliferative syndrome or ALPS, that interferes with cell death. In ALPS patients, immune cells do not die; instead they remain activated, proliferate continuously, and attack the body resulting in uncontrolled cell growth. Abnormalities in the communication of these interacting cells lead to dysregulation of the immune response. [12]

**National Institute of Health**




Th1 and Th2 lymphocytes and their characteristic cytokines possess opposite roles in the regulation of the immune system. Th1 cytokines participates mainly in the regulation of the cellular defense while Th2 lymphocytes activate B cells and regulate the immunoglobulin synthesis and switch via their characteristic cytokines.

As Th1 and Th2 cytokines can inhibit the secretion of the opposite type of cytokines, the changes in this sensitive Th1/Th2 balance is thought to be critical in the pathogenesis of several immunological disorders. Th1 dominance has been described in several organ specific autoimmune diseases including diabetes, rheumatoid arthritis, and Crohns disease.

"There is now abundant evidence to show that clinical disease including autoimmune disease, infectious disease and allergic disorders are due to abnormal communication and signaling pathways in the human body." [13]

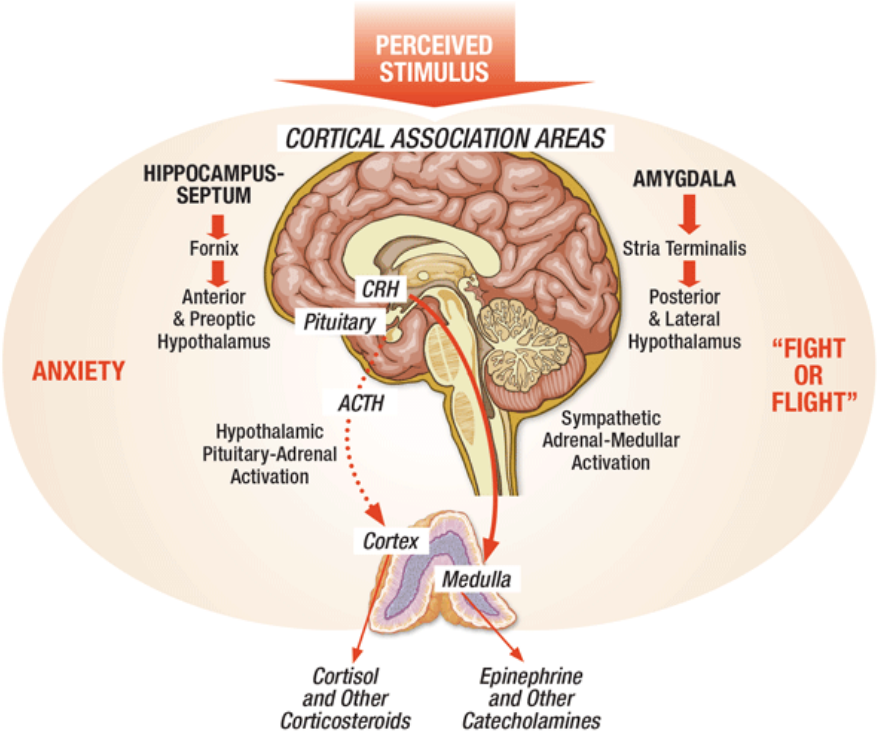
**Harvard School of Public Health**

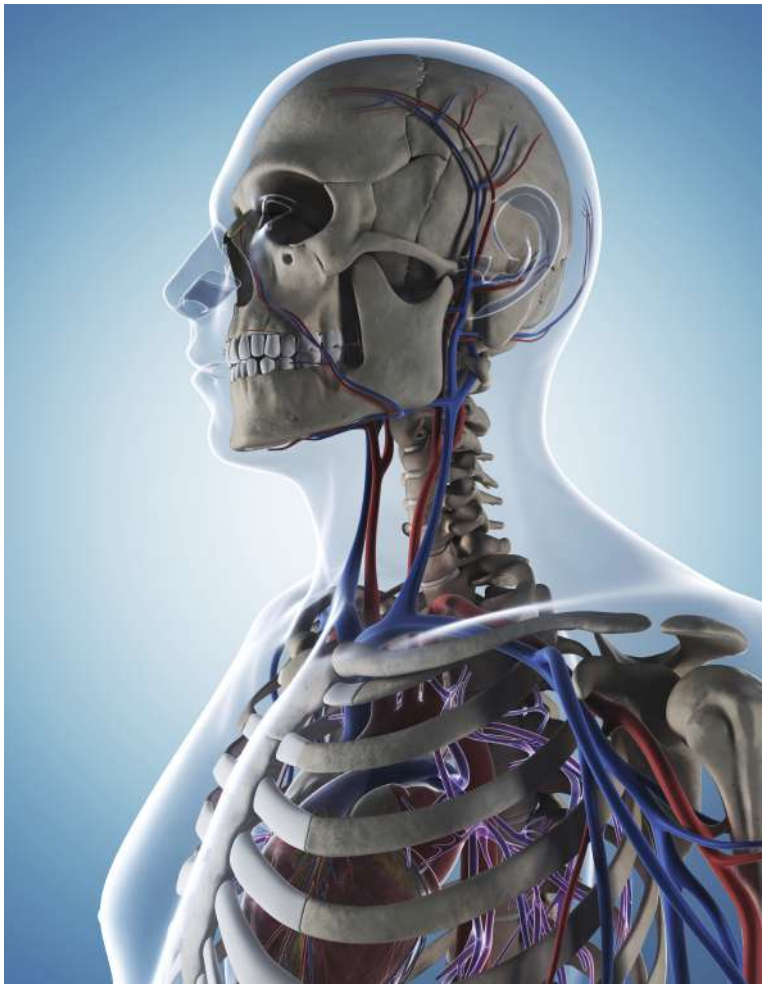
## Immune Dysfunction and Stress

Substantial research has clearly demonstrated that a wide range of stress can deplete immune system resources and adversely affect neurological and biological communication resulting in abnormal levels of B and T cells, decreased responsiveness of natural killer cells, and fewer IgA antibodies to be secreted in the saliva.

**Stress can be defined as "a state of disharmony or threatened homeostasis provoked by psychological, environmental, and physiological stressors.**

Stress is also invoked as an important part of the normal response to stimuli and should not be thought of as an abnormal reaction since it involves the "fight or flight" principle.





Much of this response is mediated through the hypothalamic-pituitary pathway and is integrated in the hypothalamus to monitor and control certain functions such as the sympathetic nervous system and endocrine system.

**Although stress is generally associated with negative connotations, it is a double-edged phenomenon. The body would not be able to survive without the acute stress response, as it prepares the body for short, emergency responses to potentially life threatening situations**.

However, a lingering stress response to non-emergency situations is bad and can lead to chronic health conditions. Stress becomes a hazard to the body when the communication systems of the body are interrupted or overwhelmed by a variety of physical, chemical or emotional stressors.

## Types and Causes of Stress

**Physical:** The primary cause of communication breakdown is nerve interference in the spinal column. When the spine is in its proper, structural position, it protects the nerve pathways and allows the nervous system to send and receive information.

However, because the spine is moveable, it is also susceptible to various physical stresses and forces which can cause the spinal vertebra to lose their proper, structural position. These spinal misalignments cause abnormal reflexes, loss of normal mechanoreceptor function, and nerve interference which reduces the overall effectiveness of the communication of the body.

**Chemical:** There are more drugs designed to treat and suppress components of the inflammatory response than any other single category in the world, in fact there are more drugs whose primary purpose is to inhibit the normal communication of the nervous and immune system than all of the rest of the drugs combined.

Drugs may result in a temporary reduction of symptoms, but they do little to improve and optimize the actual healing process and often lead to dangerous side effects and immune system disorders.

Antibiotics have become a popular weapon in the medical arsenal against disease. Although no one would argue with the appropriate use of antibiotics, there is a tremendous volume of research which clearly demonstrates that antibiotics have been grossly overused resulting in weakened immune systems and stronger bacteria and foreign microbes.

**Emotional**: There is an abundant body of scientific research to support the concept that emotional stress has a negative impact on the immune system. Thoughts and emotions can trigger complex chemical reactions that affect multiple body systems and particularly the immune system. Periods of intense emotional stress can result in decreased levels of natural killer cells, sluggish killer T cells, and diminished macrophage activity.

## Conclusion

At all biological levels (molecular, cellular, organ), communication between elements is essential for the proper functioning of system. This communication process is essential to the homeostasis of the body. The foundation of health begins with a properly function nervous system to the extent that we can equate levels of function and healing capability with the ability of the nervous system to send and receive information. The trend in immunological research clearly demonstrates that restoring, balancing, facilitating and maximizing the communication systems of the body is the key to optimal health and immune function.

"Pressed by patients and advancing technology, health care will soon change its focus from treatment to enhancement, from repair to improvement, from diminished sickness to increased performance. The transformation has already begun. Accompanying this will be an increased emphasis on psychoneuroimmunology, the science that deal the minds role in helping the immune system to fight disease. Which will become a vitally important clinical field-perhaps the most important field in the 21st century." [14]

**Michael Crichton, M.D.**

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# CHIROPRACTIC PATIENT EDUCATION AND MARKETING TOOLS

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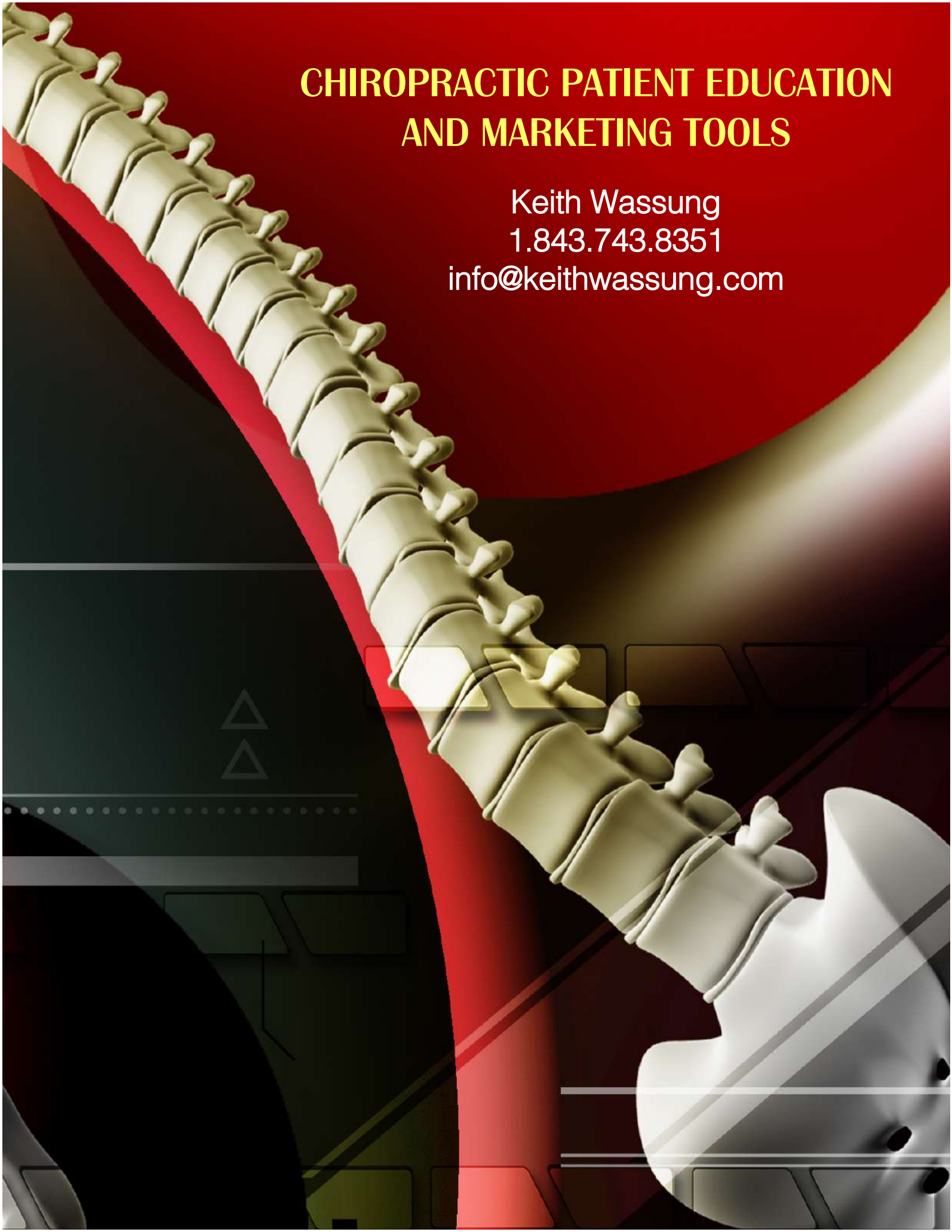

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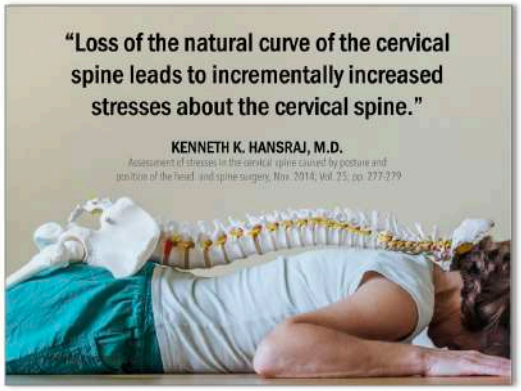


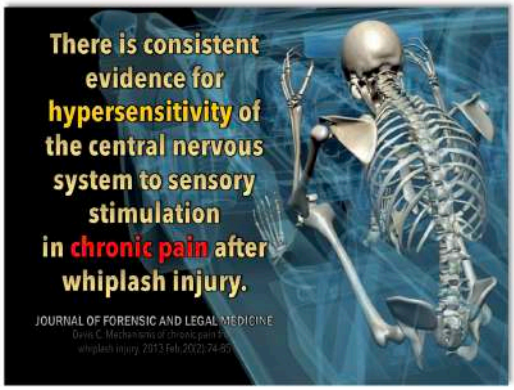



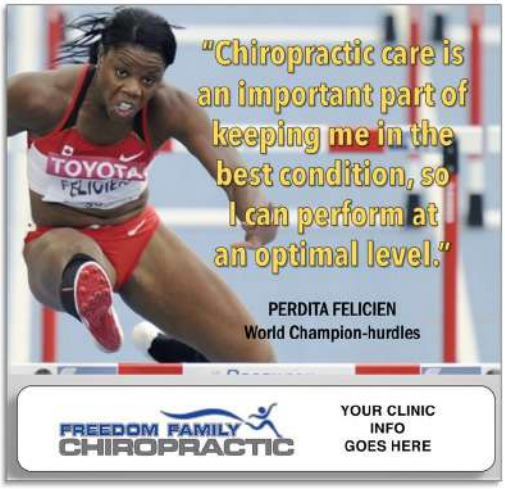


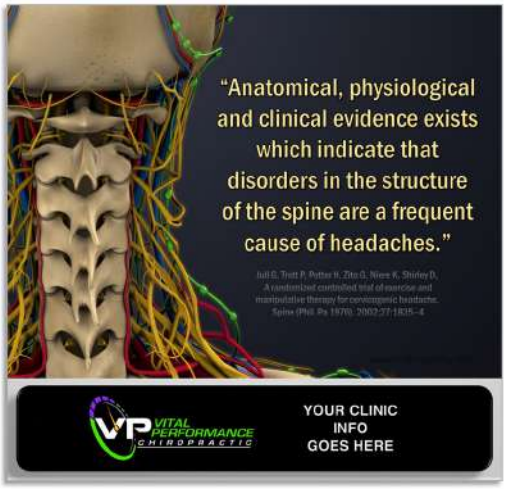


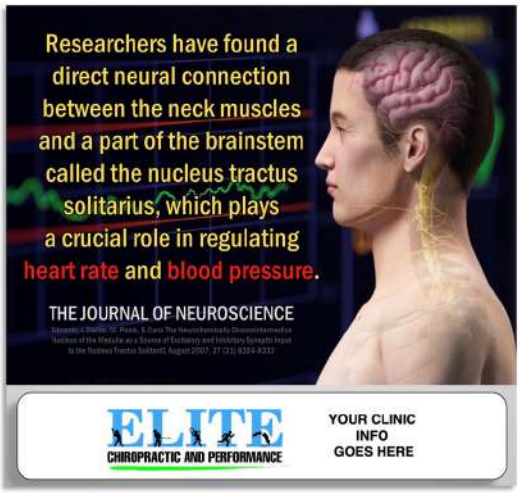


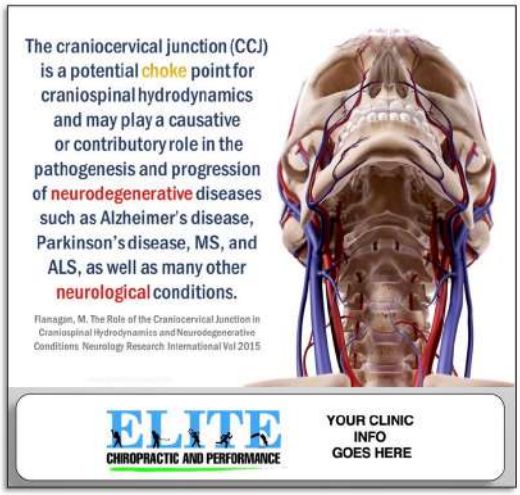



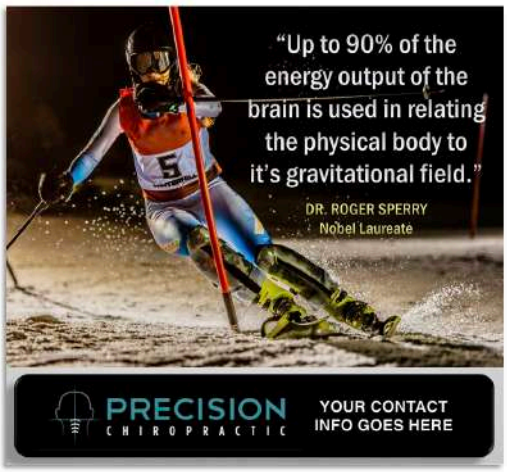


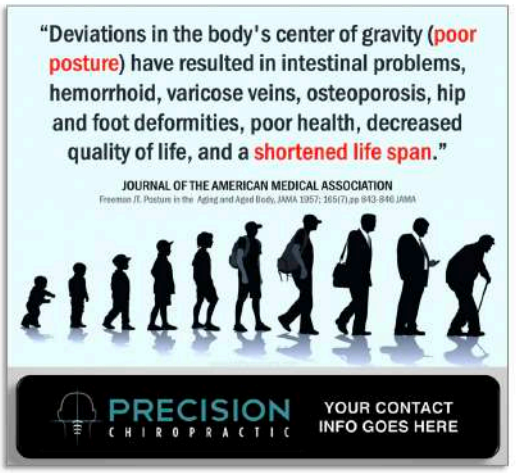


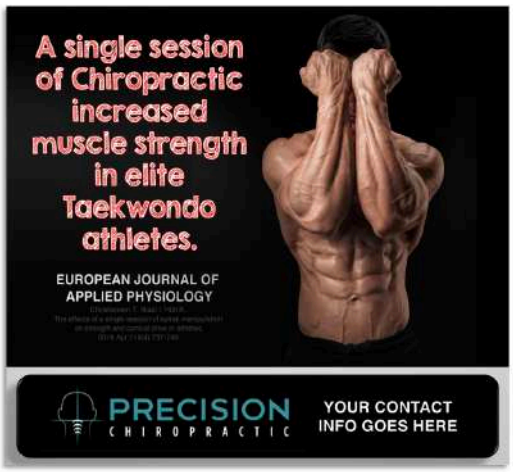


"Interference to the nervous system results in damage within a short period of time and therefore, Chiropractic care should begin at birth on a preventive basis."
DR. ARPAD DENAGY
FREEDOM FAMILY CHIROPRACTIC
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A study with 316 children showed significant improvement with colic in response to Chiropractic adjustments. The three month long study showed a satisfactory of Chiropractic adjustments in 94% of the cases. The improvements occurred after an average of only three adjustments within two weeks.
RESTOREFAMILY CHIROPRACTIC
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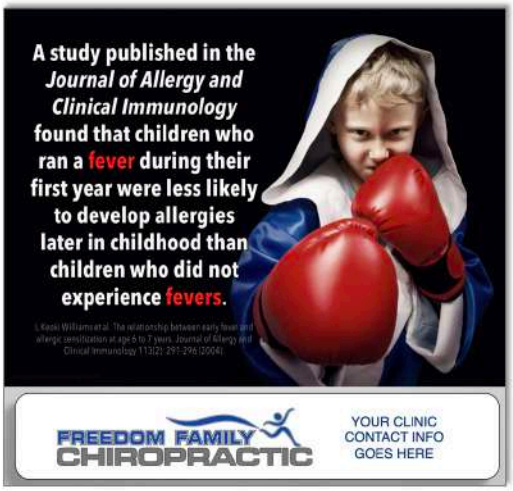
A study published in the Journal of Allergy and Clinical Immunology found that children who ran a fever during their first year were less likely to develop allergies later in childhood than children who did not experience fevers.
FREEDOM FAMILY CHIROPRACTIC
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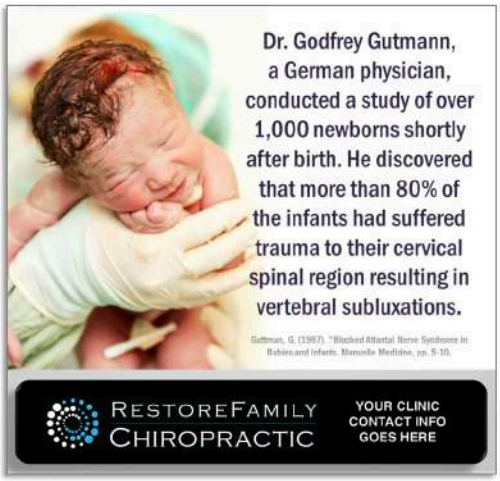
Dr. Godfrey Gutmann, a German physician, conducted a study of over 1,000 newborns shortly after birth. He discovered that more than 80% of the infants had suffered trauma to their cervical spinal region resulting in vertebral subluxations.
RESTOREFAMILY CHIROPRACTIC
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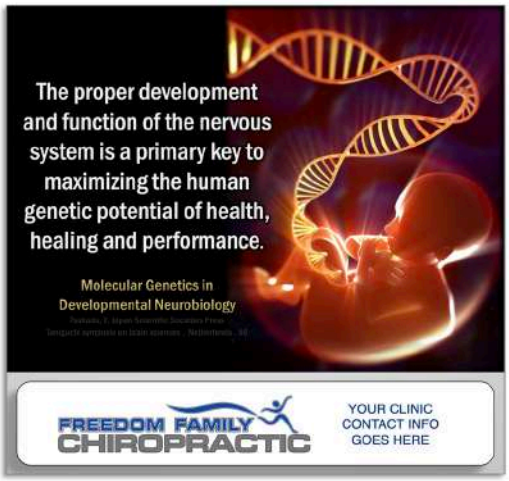
The proper development and function of the nervous system is a primary key to maximizing the human genetic potential of health, healing and performance.
Molecular Genetics in Developmental Neurobiology
FREEDOM FAMILY CHIROPRACTIC
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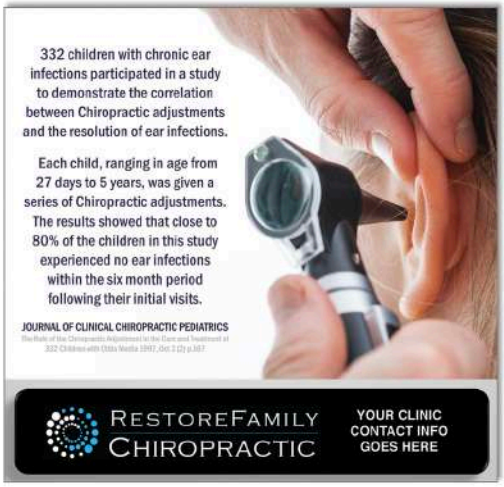
332 children with chronic ear infections participated in a study to demonstrate the correlation between Chiropractic adjustments and the resolution of ear infections.
Each child, ranging in age from 27 days to 5 years, was given a series of Chiropractic adjustments. The results showed that close to 80% of the children in this study experienced no ear infections within the six month period following their initial visits.
JOURNAL OF CLINICAL CHIROPRACTIC PEDIATRICS
RESTOREFAMILY CHIROPRACTIC
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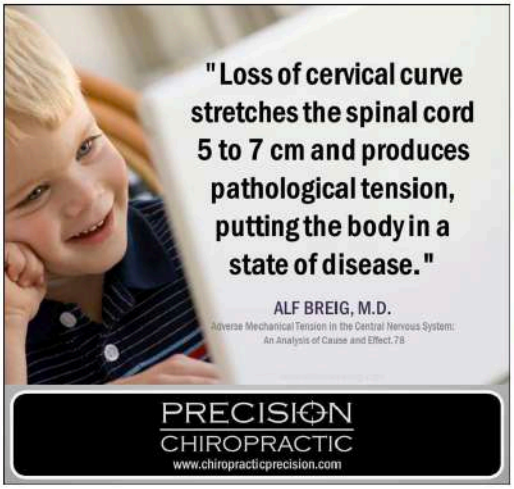
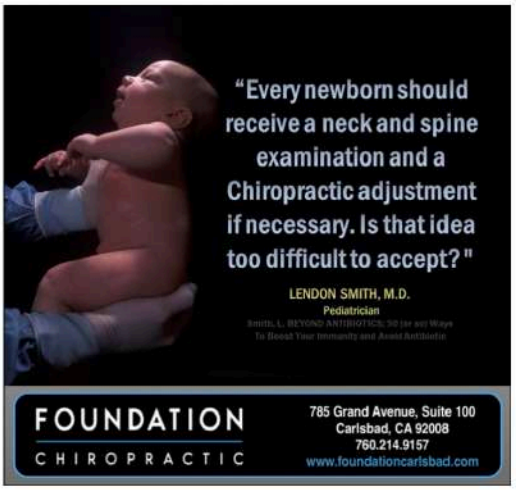
"Many internal disorders are resolved by the spinal adjustment alone. Leaving the adjustment out of the treatment plan invites failure."
Felix Mann, M.D.
Paul Nagler, M.D.
Kungo Magayama, M.D.
BACK2HEALTH CHIROPRACTIC
www.backtohealth.com


"Loss of cervical curve stretches the spinal cord 5 to 7 cm and produces pathological tension, putting the body in a state of disease."
ALF BREIG, M.D.
Adverse Mechanical Tension in the Central Nervous System: An Analysis of Cause and Effect.78
PRECISION CHIROPRACTIC
www.chiropracticprecision.com


"Every newborn should receive a neck and spine examination and a Chiropractic adjustment if necessary. Is that idea too difficult to accept?"
LENDON SMITH, M.D.
Pediatrician
FOUNDATION CHIROPRACTIC
785 Grand Avenue, Suite 100
Carlsbad, CA 92008
760.214.9157
www.foundationcarlsbad.com


For every inch of forward head posture, it can increase the weight of the head on the spine by an additional ten pounds.
DR. ADALBERT KAPANDJI
Physiology of the Joints, Volume 3, June 2008
RESTOREFAMILY CHIROPRACTIC
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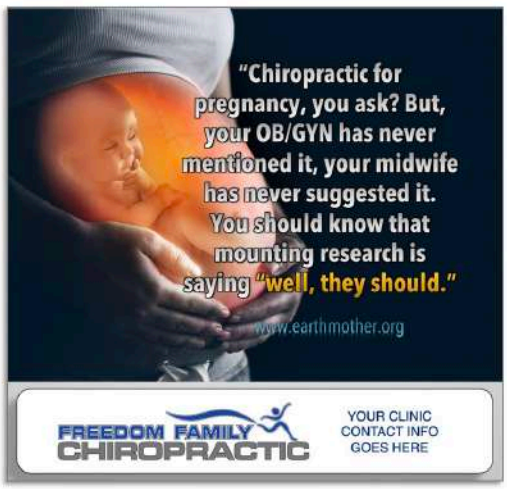
"Chiropractic for pregnancy, you ask? But, your OB/GYN has never mentioned it, your midwife has never suggested it. You should know that mounting research is saying "well, they should."
www.earthmother.org
FREEDOM FAMILY CHIROPRACTIC
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Research suggests that spinal adjustments may have a direct effect on certain aspects of immune function. This study showed that when the thoracic spine was adjusted, the respiratory burst cycle of white blood cells was enhanced.
Brennan, P. & Hondras, M. Priming of Neutrophils for Enhanced Respiratory Burst By Manipulation of the Thoracic Spine. 89
RESTOREFAMILY CHIROPRACTIC
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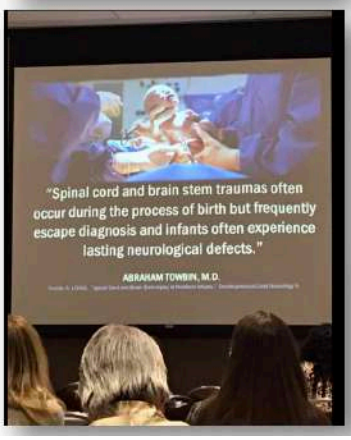
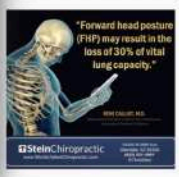


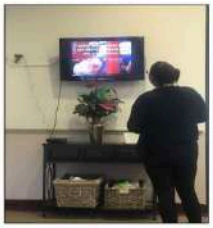



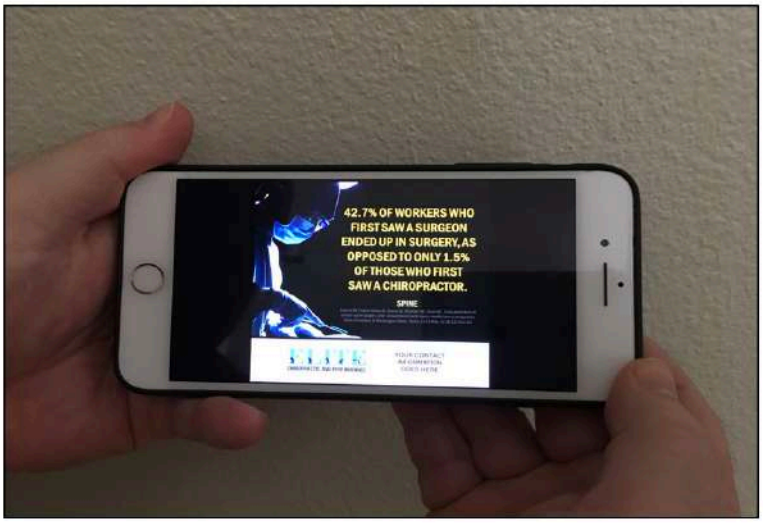




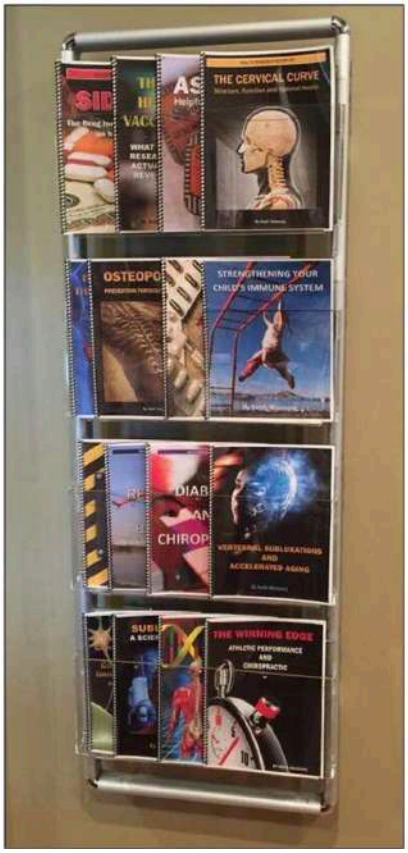

## RUN THIS ENGAGING PRESENTATION IN YOUR RECEPTION ROOM OR OTHER PATIENT AREAS


WHEN YOUR PATIENTS SEE SLIDES THEY LIKE (AND THEY WILL.) YOU SEND THEM THE CUSTOMIZED JPEG. NOW THEY HAVE THEIR FAVORITE SLIDES ON THEIR PHONES AND CAN EASSILY SHOW AND SHARE WITH OTHERS AS WELL AS POST ON THEIR OWN SOCIAL MEDIA PAGES.

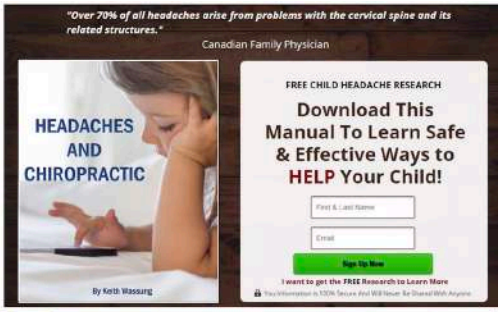


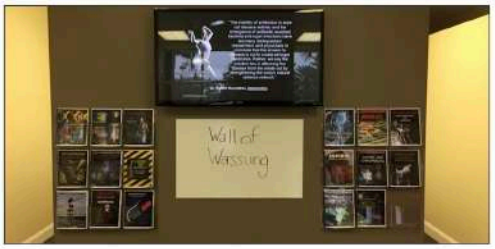


# 20 HEALTH RESEARCH E-REPORTS

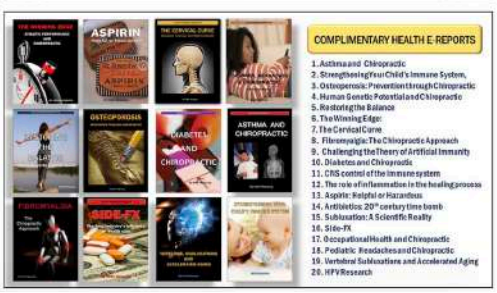



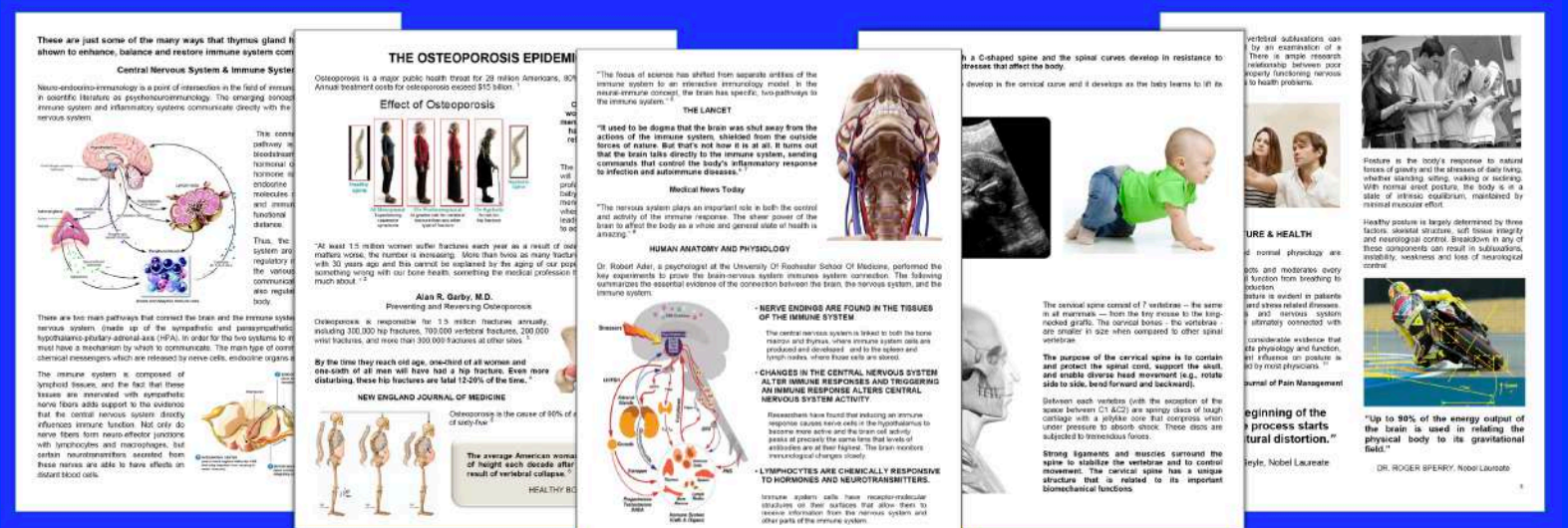






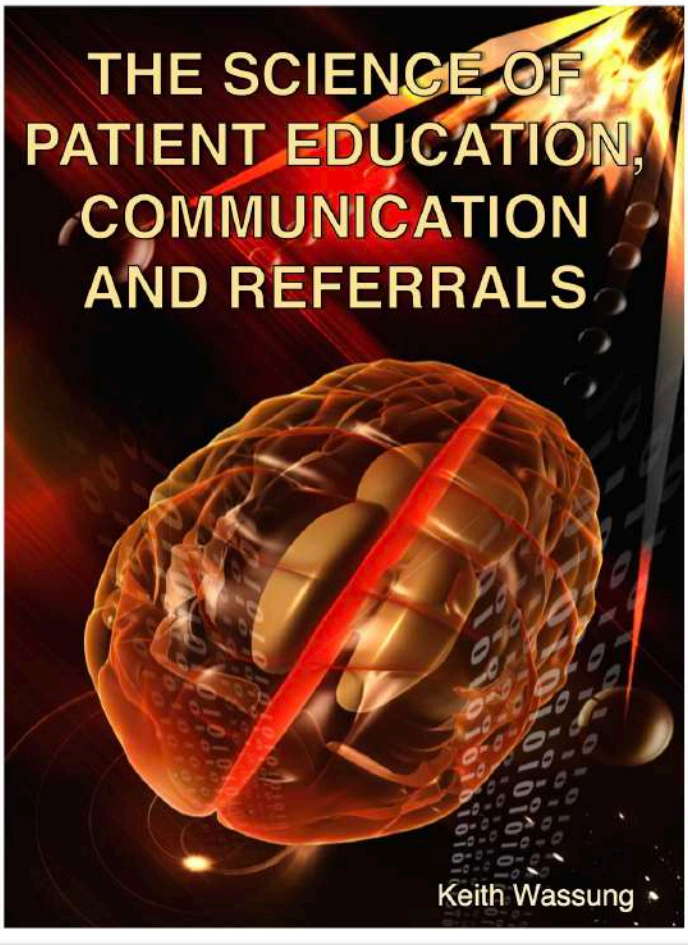



Last page of each report is customized with clinic logo, contact information and digial hyperlinks.

Full citations for each reference


# 12 POWER POINT LECTURES




Includes 12 scripted and narrated Power Point Presentations, 4 instructional videos and a complete step by step guide to internal patient education and referral programs, as well as community outreach and marketing programs including:

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- A different approach to Spinal Screenings
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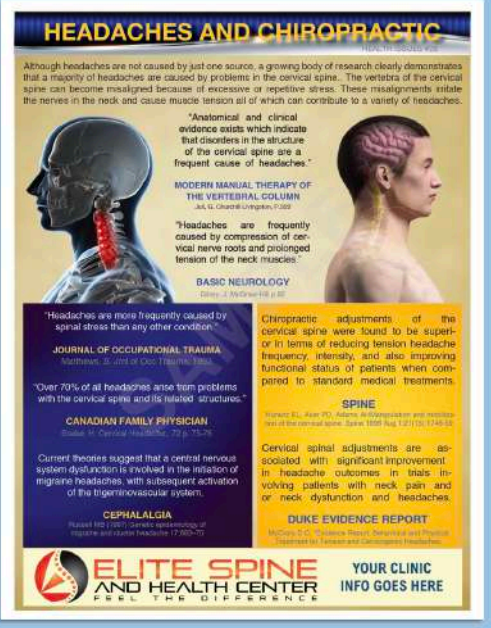
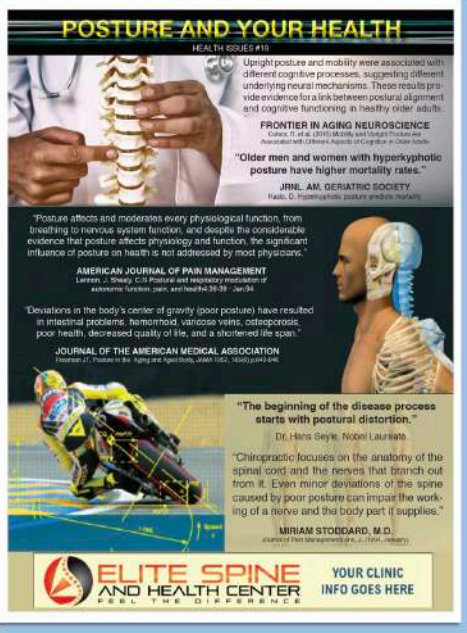
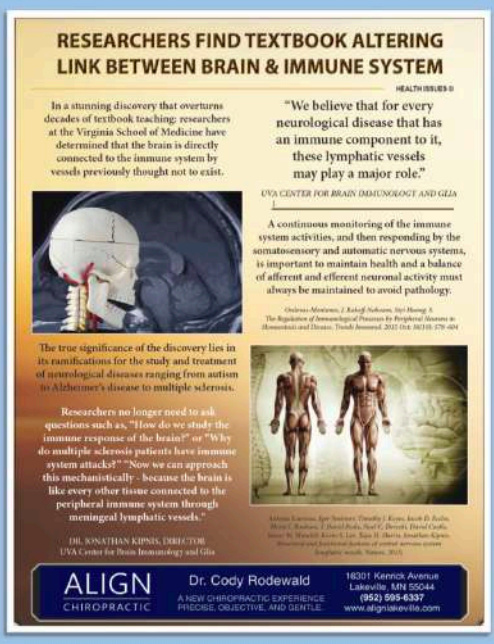
# HEALTH ISSUES RESEARCH SERIES












# TMJ: THE CHIROPRACTIC APPROACH

HEALTH ISSUES #41

TMJ is short for temporomandibular joint. There's one on each side, and they attach your jaw to the bottom of your skull. The muscles near them let you to open and close your mouth, but sometimes, the joints get out of line. You might have heard that problem called TMJ, but it's actually TMD—temporomandibular joint disorder. Up to 15% of adults have TMJ/TMD, and it affects women twice as often as men. There are many things that can contribute to this disorder, but a growing body of research is demonstrating the involvement of spinal nerve dysfunction and the role that a Chiropractor can play in helping to resolving these issues.

**"There is a significant relationship between TMJ and neck pathologies."**

JRNL OF INTERDISCIPLINARY MED & DENTAL SCIENCE

Sufiyan N, Sicora U, Samad M. Contribution of Cervical Spine in Temporomandibular Joint Disorders.Sept 15, 2015

The correlation between jaw disability and neck disability was significantly high. These findings emphasize the importance of considering the cervical spine when evaluating and treating patients with TMD.

**BIOMED RESEARCH INTL**

Silveira, A. Gadotti I. Armijo- S.Jaw dysfunction is associated with neck disability. 2015;512792.

A study showed that patients with TMJ had greater forward head posture than the control group.

**JOURNAL ORAL & FACIAL PAIN**

Lee, W. Okeson, JP. Lindroth J. The relationship between forward head posture and TMJ. (95) 161-7

A comprehensive study of 14 patients who presented with TMD symptoms received chiropractic care. All patients selected for this case series showed a reduction of temporomandibular dysfunction symptoms.

**JRNL CHIROPRACTIC MED**

Pavia D, Fisher R, Roy R. Chiropractic Treatment of Temporomandibular Dysfunction. 2015 Dec (14) 4

Collaboration between a dentist and a chiropractor may help to provide quick resolution for patients with TMD. Taking into account the neurological and biomechanical connection to the cervical spine, dentists and chiropractors have the potential to help patients through co-management.

**JOURNAL CHIRO MED**

Rubis, L. DC, MS, Rubis. DDS.2014 Mar; 13 (1) 55-61

"Chiropractic can often resolve issues associated with TMJ disorders."

**CLEVELAND CLINIC**

TMJ " A Chiropractic & Functional Med. Approach. Dec 12, 2014

When a patient's TMD is due to incorrectly positioned bones in the neck, a chiropractor may be able to help ease this condition.

**COLGATE RESEARCH**

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# BOXING, MARTIAL ARTS AND CHIROPRACTIC

HEALTH ISSUES #39

The goal of the boxer and martial artist is to train the body and mind to harness power, speed, balance, coordination and timing to be the best they can be. This as heavily dependent on a finely tuned nervous system to allow all the important reflexes to function properly. This is why boxers and martial artists at all levels often receive periodic Chiropractic adjustments to ensure peak performance in training and in competition.

A group of judo athletes receiving chiropractic significantly improved their grip strength compared to a group not receiving chiropractic.

**JRNL OF MANIPULATIVE & PHYSIO THER.**

Botelho, M. "Effect of cervical spine manipulative therapy on judo athletes' grip strength. 2012 Jan; 2: 38-44

"I have to have an adjustment before I go into the ring. I found that going to a chiropractor three times a week helps my performance. The majority of boxers go to chiropractors to get that extra edge."

**EVANDER HOLYFIELD**
Heavyweight Boxing Champion

A single session of chiropractic increased muscle strength in elite Taekwondo athletes.

**EURO JRNL OF APPLIED PHYSIOLOGY**

Christensen, T. Rauz, I. Prof. K. Nedergaard, W. The effects of a single session of spinal manipulation on strength & cortical drive in athletes. 2018 Apr; 118(4): 737-749

"I've been seeing a chiropractor since I was a teenager. It has been the change in my life that has allowed me to participate in professional athletics and to achieve six world championships."

**FRANK SHAMROCK**

"Without chiropractic I would not have won the championship."

**PAUL VADEN**
IBF WORLD JR MIDDLEWEIGHT CHAMPION

PRECISION CHIROPRACTIC

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# ADHD AND CHIROPRACTIC

HEALTH ISSUES #40

**Attention-deficit/hyperactivity disorder (ADHD)** is a developmental neurobehavioral disorder characterized by symptoms of inattentiveness, hyperactivity, and impulsiveness. It affects up to 10% of children and 5% of adults worldwide. The number of children being diagnosed ADHD, has increased 53 percent in the past decade. Emerging research is demonstrating that spinal nerve dysfunction may play either a primary cause or significant contributing factor in ADHD.

**"Up to 50% of children with ADHD exhibit motor abnormalities including altered balance and postural abnormalities."**

**GAIT POSTURE**

Buderath, P. Gartner, K. Frings, M. Postural and gait performance in children with attention deficit/hyperactivity disorder. 2009 Feb;29(2):249-54

Humans are born with a reflex called "symmetric tonic neck reflex" (STNR). This reflex helps us to operate our upper and lower body independently. This can be achieved through crawling for at least six months. It has been found that at least 75 percent of those diagnosed with ADHD/learning disorders had immature symmetric tonic neck reflex contributing to their condition.

Konczarska J, Pietr P, Rejdych J. Persisting primitive reflexes in medication-naive girls with attention-deficit and hyperactivity disorder. Neuropsychiatric Disease and Treatment 2013; 9

**"Disruption of neurological signaling results in ADHD-like behavorial manifestations."**

Sandau, S. Astrocyte-Specific Disruption of ErbB4/ARF1 Signaling Results in ADHD-Like Behavioral Manifestations. PLoS One. 2012; 7(4)

The reduction of the upper cervical vertebral subluxation was concomitant with improved quality of life, sleep and visual evoked responses in a patient with Attention Deficit Disorder.

Dickholtz M. Improvement in Quality of Life in a Patient with ADHD Journal Upper Cervical Chiro Res. August 27, 2012;71-6

**"Our findings found improvement in ADHD symptoms as well as behavioral, social, or emotional difficulties, and (they) provide supporting evidence on the effectiveness of chiropractic in the treatment of children with ADHD."**

Explore (NY). 2010 May-Jun;6(3):173-82. The chiropractic care of children with attention-deficit/hyperactivity disorder: a retrospective case series.

FOUNDATION CHIROPRACTIC

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# CHIROPRACTIC AND BLOOD PRESSURE

HEALTH ISSUES #31

Elevated blood pressure is one of the leading risk factors for global mortality. A growing body of research is demonstrating the relationship between spinal structure and systemic issues including blood pressure. Chiropractic adjustments are not a treatment for blood pressure issues. Their purpose is to restore and maintain proper spinal structure and alignment to allow the body to function properly and to optimize its inherent healing capability.

Researchers have found a direct neural connection between the neck muscles and a part of the brainstem called the nucleus tractus solitarius, which plays a crucial role in regulating heart rate and blood pressure.

**THE JOURNAL OF NEUROSCIENCE**

Edwards, I. The Neurochemically Diverse Intermedius Inhibitory Synapse Input to the Nucleus Tractus Solitarii 1 August 2007; 27 (31) 8411

A comprehensive study revealed a significant association between loss of cervical lordosis and decreased vertebral artery function. The decreases included diameter, flow volume, and peak systolic velocity.

**MEDICAL SCIENCE MONITOR**

Rubis MD, Ajmed MD. Decreased Vertebral Artery Hemodynamics in Patients with Loss of Cervical Lordosis. 2012 Jul 11;18:CR 446-56

**"Cervical spondylosis may be one of the causes of secondary hypertension."**

**MEDICINE**

Hemodynamic Study of Blood Flow in Cervical Spondylosis Patients. 2011 Mar;90:151-60

**"High correlation has been observed between disorders of the cervical spine and hypertension."**

**BIOMED RESEARCH INTERNATIONAL**

Zhong Yuan Hu. Alteration of Sympathetic Cause of Left Blood Pressure. 2015

75 patients showed statistically significant changes in blood pressure following Chiropractic adjustments.

**JRNL. MANIPULATIVE PHYSIOL. THER.**

Arbuckle, Thomas. Does Cervical Spine Chiropractic Adjustment Influence Cardiometric Outc. 1995; 17 (5): 291-300

Anatomical abnormalities of the cervical spine at the level of the atlas vertebra are associated with relative ischemia of the brainstem circulation and increased blood pressure. Manual correction of this misalignment resulted in reduced arterial pressure.

**JOURNAL OF HUMAN HYPERTENSION**

Rubis D, De Kerle, M. Niven P. Atlas vertebra malalignment and hypertension of arterial pressure and it hypertensive mechanism

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# THE CRANIOCERVICAL JUNCTION

in Systemic Health and Neurodegenerative Conditions

HEALTH ISSUES #12

**The Craniocervical Junction** is a complex region where the skull and upper cervical spine connect. It is composed of 2 joints—the atlantooccipital and the atlantoaxial joints—and houses the spinal cord, multiple cranial nerves, and many important blood and lymphatic vessels that supply the head and neck. Thus, the CCJ must protect its contents while simultaneously allowing significant head and neck mobility.

Neural tissue is flexible and susceptible to compression. Craniocervical junction abnormalities can cause or contribute to cervical spinal cord or brain stem compression. A landmark paper published in the *Neurology Research International* revealed astonishing relationships between biomechanical abnormalities of this region and systemic heath issues and conditions.

"The Craniocervical Junction (CCJ) is a potential choke point for craniospinal hydrodynamics and may play a causative or contributory role in the pathogenesis and progression of neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, MS, and ALS, as well as many other neurological conditions."

"Malformations and misalignments of the craniocervical junction cause both deformation and obstruction between the cranial vault and the spinal canal that can result in neurological disorders including hydrocephalus, idiopathic intracranial hypertension, migraines, seizures, silent-strokes, affective disorders, schizophrenia, and psychosis."

Parkinson, M. The Craniocervical Junction in Craniospinal Hydrodynamics and Neurodegenerative Conditions

**A growing body of scientific research is demonstrating the relationship between spinal function and systemic health.**

Anatomical abnormalities of the cervical spine at the level of the atlas vertebra are associated with relative ischemia of the brainstem circulation and increased blood pressure. Manual correction of this misalignment has been associated with reduced arterial pressure.

JOURNAL OF HUMAN HYPERTENSION
Rubis, D. Dickholtz, M. 2007

**"With few exceptions, hormone deficiency or hormone excess is the result of pathologic manifestations in the neural pathways that supply the hypothalamus."**

PRINCIPLES OF INTERNAL MEDICINE

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# MUSICIANS AND CHIROPRACTIC

HEALTH ISSUES #38

There is a high rate of injury to musicians that can impact performance and in many cases can be career ending. Incorrect posture, overuse, stress, insufficient rest, excessive force and incorrect ergonomic technique all contribute to chronic pain and injuries that spell the end to careers. The use of regular Chiropractic care has proven to be invaluable to musicians at all levels of performance.

80% of musicians will experience an injury that affects their ability to play their instrument, and these performance-related injuries are even common among the school aged talented students.

**FRONTIERS IN PSYCHOLOGY**

Brown J, Ackerman, Sound Practice. 2014 Sep

Spinal dysfunction leads to neurological stress, which weakens your health and makes your body more prone to break down. Chiropractors can often correct these areas of spinal dysfunction, so that your body begins to function better.

**ALLEGRO MUSIC JOURNAL**

VOL.01, #1, JAN 2001

**Musicians who are serious about their craft should consider getting checked by a Chiropractor.**

INTERNATIONAL MUSICIAN JOURNAL

Capasso, D. Musicians and Chiropractic Care: Perfect Harmony April 12, 2014

***"I need regular Chiropractic adjustments to balance my body. It definitely assists my concentration, endurance and performance quality."***

**HANS-PETER DROBISCH, World Renowned Flutist**

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# THE ROLE OF FEVER IN HEALING AND REPAIR

HEALTH ISSUES #20

Fever is a systematic response to infection. It is generally agreed that moderate elevation of body temperature improves the body's disease fighting ability. A fever caused by infection actually helps the body destroy its microbial invaders.

**HUMAN ANATOMY & PHYSIOLOGY**

Marieb, E. Human Anatomy and Physiology. P.1 19


**A study published in the Journal of Allergy and Clinical Immunology found that children who ran a fever during their first year were less likely to develop allergies later in childhood than children who did not experience fevers.**

L. Ezeh Williams The relationship between early fever and allergic sensitization at age 6 to 7 years. Journal of Allergy and Clinical Immunology 113(2): 281-286 (2004)

One of the reasons that you feel bad when you have the flu, is that higher levels of interferon cause you to have certain symptoms, including fever and chills. This is evidence that your body is working hard to get rid of the virus.

**CELLULAR & MOLECULAR LIFE SCIENCES**

Mahony, R. Gargan, S. Roberts, G. A novel anti-viral role for START1 in IFN-α signaling responses. 2010

"Fever is the body's normal response to infection, it's a natural defense mechanism. A high temperature triggers the body's production of infection fighting white blood cells and inhibits the growth of viruses and bacteria. If you lower the fever, you may be affecting the body's ability to respond to that infection."

**PEDIATRICS**

Sullivan, J. Fever and Antipyretic Use in Children. Pediatrics. Mar 2011; Vol 127 (4)

Scientists have found more evidence that elevated body temperature helps certain types of immune cells to work better and that the immune system might be temporarily enhanced functionally when our temperatures rise with fever.

**JOURNAL OF LEUKOCYTE BIOLOGY**

Mace, A. Zhong, L. Kilpatrick, C. Differentiation of CD8+ T cells into effector cells is enhanced by physiological range hyperthermia. Nov. 2011; 90: 951-962

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# FOOTBALL AND CHIROPRACTIC

HEALTH ISSUES #13

**Football players of all ages, from youths to professionals utilize Chiropractic because it is a drug-free way to better health and performance. Chiropractic adjustments help ensure that the body functions as efficiently as possible, which can maximize healing, ensure optimal recovery from all types of injuries as well as help in the prevention of injuries.**

**31 percent of NFL teams use Chiropractors in an official capacity as part of their staff and a full 77 percent of the trainers have referred players to a Chiropractor.**

Stump, J. DC, Redwood, D. DC. JMPT, March/April 2000, Volume 23 - Number 3 The use and role of sport Chiropractors in the National Football League

"Performing at my best is important to me and should be to everyone. Getting adjusted regularly, along with practicing other good health habits, are all part of my goals, to win in life and on the field."

**AARON RODGERS**
TWO-TIME LEAGUE MVP SUPER BOWL XLV MPV

**"As long as I see the Chiropractor, I feel like I am one step ahead of the game."**

**TOM BRADY**
5X Super Bowl Champion

"I definitely try to get on a basis where I use Chiropractic at least twice a week. I would definitely say it helps me to perform at a higher level."

**EMMITT SMITH, NFL Hall of Fame**

**"Do I believe in Chiropractic? Let me answer it this way. I've sent over 30 of my teammates, including All-Pro quarterback Joe Montana to the Chiropractor. Because of Chiropractic, I have never missed a game in 8 years. What does that tell you about my feelings about Chiropractic?"**

**ROGER CRAIG, NFL 80's All Decade Team**

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# TEXT NECK AND YOUR HEALTH

HEALTH ISSUES #23

**Text-Neck** is a global epidemic and people all over the world, especially the younger generations are suffering the effects.

**MSNBC**

Tapia, K.M. Beware text neck: too much gadget use. 10/7/2011

**The neck of the human body is a bio-mechanical marvel. It possesses a wide range of mobility in nearly every direction and serves as a conduit for the major blood vessels to the brain and is the primary pathway of the central nervous system.**

This region is one of the most important areas of the body and its structural integrity and function are absolutely critical to overall health.

**"A typical high school student may spend an extra 5,000 hours in poor posture per year due to cell phones and mobile devices."**

KENNETH K. HANSRAJ, M.D.

"Assessment of Stresses in the Cervical Spine Caused by Posture and Position of the Head". Iwata and Spine Surgery. Nov. 2014; Vol. 3

When you bend your head forward at 15 degrees, its weight effectively increases from 12 pounds to 27 pounds. At 45 degrees, your head exerts 49 pounds of force, and at 60 degrees, 60 pounds—this is like carrying an eight year-old child around on your neck for several hours a day.

**Research has demonstrated a strong association between forward head posture and decreased respiratory strength and function.**

Kapreli E. Vlouzzana E. Billis E. "Respiratory dysfunction in chronic neck pain patients". Cephalalgia. 2009 Jul 29(7):701-10

Every inch of forward head posture can increase the weight of the head on the spine by an additional ten pounds.

Kapandji A. "The Physiology of the Joints", Vol 3: The Spinal Column, Pelvis Girdle and Head

**"Loss of cervical curve stretches the spinal cord 5 to 7 cm and produces pathological tension, putting the body in a state of disease."**

Yang, HF. Adverse Mechanical Tension in the Human Nervous System: An Analysis of Cranial and Effect. 10

Neck issues often affect children with numerous risk factors contributing to their development. Increased stresses regarding the cervical spine may lead to cervical degeneration along with other developmental, medical, psychological and social complications.

Fares, J. Should Computer Neck pain in students: risk factors and consequences. Neuro Ind. 2017; 8: 22

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# THE EDUCATION AND TRAINING OF A DOCTOR OF CHIROPRACTIC

Educational requirements for doctors of chiropractic are among the most stringent of any of the health care professions. The typical applicant at a chiropractic college has already acquired nearly four years of pre-medical undergraduate college education, including courses in biology, inorganic and organic chemistry, physics, psychology and related lab work. Once accepted into an accredited chiropractic college, the requirements become even more demanding — four to five academic years of professional study are the standard. Because of the hands-on nature of chiropractic, and the intricate adjusting techniques, a significant portion of time is spent in clinical training.

Doctors of chiropractic — who are licensed to practice in all 50 states, the District of Columbia, and in many nations around the world — undergo a rigorous education in the healing sciences, similar to that of medical doctors. In some areas, such as anatomy, physiology, rehabilitation, nutrition and public health, they receive more intensive education than their MD counterparts.

Like other primary health care doctors, chiropractic students spend a significant portion of their curriculum studying clinical subjects related to evaluating and caring for patients. Typically, as part of their professional training, they must complete a minimum of a one-year clinical-based program dealing with actual patient care. In total, the curriculum includes a minimum of 4,200 hours of classroom, laboratory and clinical experience. The course of study is approved by an accrediting agency which is fully recognized by the U.S. Department of Education. This has been the case for more than three decades.

Records from insurance and court cases have constantly shown that chiropractic is the safest portal of entry health care available to the public today. Although no healthcare procedures are 100% safe, chiropractic stands on its record of safety and effectiveness unmatched in healthcare.

The chiropractic adjustment is a safe, efficient procedure which is performed nearly one million times every working day in the United States.

There is a singular lack of actuarial data that would justify concluding that chiropractic care is in any way harmful or dangerous. Chiropractic care is non-invasive, therefore, the body's response to chiropractic care is far more predictable than its reactions to drug treatments or surgical procedures. Of the nearly one million adjustments given every day in this country, complications are exceedingly rare.

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