

The Immune System

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Immune System Clinical Basics

The main organs of the Immune System are the Thymus (near the top middle of your chest) and bone marrow. Bone marrow actually creates stem cells that become white blood cells. White blood cells enter the Thymus where they develop into T-cells. There are other partners in this immunity orchestra. These partners are the Lymphatic System which consists of vessels and nodes, the spleen, liver, tonsils, appendix and Peyer's Patches (in the small intestines). Those are the primary players. There's more. The Brain and Nervous System play vital roles. We humans are typically born with harmony of flow and communication between the Brain, Nervous System and Immune System. If there's suddenly an 'invader' that begins to enter or assault the human body (bacteria, virus, stressors, toxins)--essentially something the body deems undesirable--then the macrophages (specialized white blood cells) will try to attack and destroy the invader (B, T and NK--natural killer cells). There are also antibodies and messenger types of cells--referred to as cytokines. Sometimes more assistance is called for. The T-cells are alerted and they in turn begin to produce something called TNF--tumor necrosis factor, as well as interleukin and interferon. B-cells then attack the invader and our potent T-cells begin to destroy our body's cells that have been infected. When the job is done, the B and T cells go back to rest or into homeostasis. Although, there are still a few memory cells standing guard now just in the event that a sneak attack should occur.

That scenario describes immunity functioning at its best. However, there are presently increasing numbers of people with compromised Immune Systems. What may happen when the Immune System is constantly under assault or beaten down? It becomes weak or starts running renegade, creating a host of imbalances, disorders and diseases. Let's take a look at those. Many of the patients you'll see will be coping with some of these disorders and diseases related to compromised immunity.

Some contemporary Immune System Disorders, with new diseases being identified each year:

Colds, Influenza, Measles, Scleroderma, Lupus, Flu, Chronic Respiratory Conditions, Bacterial Infections, Pneumonia, Candida, Severe Allergies, Some Anemia, Gastrointestinal Disorders, Chronic Fatigue Syndrome, Rheumatoid Arthritis, Type I Diabetes, Myasthenia Gravis, Epstein-Barr, Grave's Disease, Multiple Sclerosis, Motor Neuron Diseases, Herpes, Hashimoto's;HIV/AIDS,

Stress and the Immune System

Did you know that more than 60% of all visits to medical professionals are prompted by stress-induced related symptoms? Stress has now surpassed the common cold as the most prevalent health problem in the United States. I continually read, research and teach about stress and human health and want you to know about these important facts:

- Stress is 4 times more likely to have occurred prior to reported infections in clinicals
- One of four outbreaks of illness followed some type of family crisis
- High stress in an individual's life is correlated with increased accidents and illnesses

There are also numerous stress and common cold studies that have similar results. Many of them reveal that stress nearly doubles the likelihood of becoming ill when exposed to common cold viruses. As you find time, do independent studying about the impact of stress on human immunity.

The Immune System and Nervous System

The Immune System is 'hardwired' to the Nervous System and together they communicate in complicated, intricate ways. Some compounds stimulate both while others soothe both. The autonomic nervous system (*our auto-pilot*) branches directly into the tissue of the lymph nodes, spleen, bone marrow and thymus gland. They are in direct communication with the pools of white blood cells. White blood cells possess receptors in their surfaces for neurochemicals such as adrenaline and noradrenaline.

Essentially, there's a strong direct neurochemical link between the Nervous and Immune Systems. Both the brain and immunity are interconnected. They are in constant, subtle communication with one another. More than we previously realized. The Immune System seems to behave like a wandering Nervous System--linked to our present state of mind and being.

When the body is stressed, *fight-flight-freeze mode* (survival response) occurs. When this happens, adrenaline and cortisol chemicals/hormones are released to provide an instant burst of strength and energy. During primal times, this reaction was only needed for a short time. Not so during contemporary times. Our stress is prolonged. When excess Cortisol is released and remains in the body at high levels for too long, this can cause destruction of important T-cells in the thymus gland and the release of T-cells before they mature. That may eventually lead to gradual shrinking of the thymus gland--which is the master gland of the Immune System.

Immuno-Competency

While there is no one personality type that predisposes a person to a weakened Immune System and illnesses, there are a combination of factors that have been clinically identified that tend to develop into a pattern that may make a person more likely to have a strong Immune System.

George Solomon, M.D., a pioneer in the field of psychoneuroimmunology* has identified the following 7 important features related to such immune strength or competency:

1. Being in touch with your psychological and physical needs
2. Being able to meet those needs via assertive action
3. Possessing coping skills, including a sense of control that enables one to ward off depression
4. Having the ability to express a variety of authentic emotions--including sadness and anger
5. Being willing to ask for and accept support from loved ones
6. Having a sense of meaning and purpose in one's work life, daily activities and relationships
7. Having the capacity for pleasure and play

Remember that there are a variety of other factors that come into play with immune health. Here are others for you to contemplate for personal health and wellness and in your work with patients:

- How we perceive events in our lives, what resources and supports we have in life, and

knowing what to anticipate with stress events--all determining how well we will cope.
(James Pennebaker research, Psychology Department at Southern Methodist University, Dallas, TX)

- Being a pessimist decreases immunity while optimism increases immunity (Dr. Christopher Peterson, University of Michigan/Harvard multiple studies, and David Sobel, M.D. and Robert Ornstein, PhD and Martin Seligman, PhD)
- High expectations of self or imposed by others and not being able to meet these creates immune system havoc
- Childhood trauma and abuse and domestic violence increases the susceptibility of illness--53% of female survivors of child abuse (physical, emotional, sexual) are more likely to report headaches, insomnia, fatigue, and reported more illness in general, as well as more hospitalizations.
- When an individual feels competent, has a sense of more control over his/her life, this is correlated with improved immunity
- Meaningful relationships and strong social supports increases immunity and decreases illness
- Hostile suspicious anger is a strong health hazard. Research shows links between anger, hostility and cynicism and the development of disease--immunity yes--but especially cardiovascular disease--even premature mortality
- When we understand that we have some control over our belief system, we can experience a sense of healthful control in our lives

What are some of the common stressor categories that prolong physical, psychological and social distress? Each category below impacts Immune System strength and health:

Biological Stressors

Bacteria, viruses, parasites, yeast, mold, fungi in excess

Environmental Stressors

Extremes of diverse sorts, temperature and climate changes, humidity, noise, lack of sunlight, excess sunlight, water pollution, chemical toxins and other trauma sustained in the environment

Emotional Stressors

Excess anger--inward or outward, hostility, violence, cynicism, repressed resentment, fear, anxiety, hatred, loneliness. Especially when prolonged.

Deprivation Stressors

Lack of survival needs being met--water, health food, medicines, sleep, exercise. Lack of humor, fun, joy, touch, sleep, exercise. Meaningful relationships and experiences--few or none--loneliness, boredom.

Social Stressors

Crowds, chaotic energies, media, technology, stressful world events, crime, war, violence, racism, sexism and more.

Family Stressors

Divorce, marriage, birth of child, death of loved one, changes in work status and work relationships, financial status, educational changes.

Of course, there are others too sundry to discuss in this educational handout. This is simply the beginning exploration of factors that impact Immunity. Others will be presented and discussed throughout the year.

What is Psychoneuroimmunology?

The study of the relationship between the Brain, Nerves and the Immune System. There is a complex, intricate interaction and interplay between our attitude, behavior, traits, tendencies, environment and physiological events that influence immunity. ~G.L. Stafne MH, ND

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