

Update 78

Stressed or Stressed Out: What's the Difference?

Stress is a constant factor in modern life and a frequent topic of conversation. Yet, in spite of its frequent use, the word "stress" is at best an ambiguous term. For some, it means excitement and challenge ("good stress"); for many others, it reflects an undesirable state of chronic fatigue, worry, frustration and inability to cope ("bad stress"). For this latter situation, researcher Dr. Bruce McEwen, head of the Harold and Margaret Milliken Hatch Laboratory of Neuroendocrinology at Rockefeller University in New York City, prefers the term "stressed out," which implies the chronic nature of a negative state.

Hans Selye (1907-1983) is credited with introducing the concept of stress into popular, as well as medical, discussions. Selye used the emergency reaction of the sympathetic nervous system and adrenocortical system for his classic theory of stress, which is exemplified by the "fight or flight" response. Selye postulated the general adaptation syndrome, a stereotyped physiologic response that takes the form of a series of 3 stages in the reaction to a stressor. The first stage is the alarm reaction, in which the adrenal medulla releases epinephrine and the adrenal cortex produces glucocorticoids, both of which help to restore homeostasis. Restoration of homeostasis leads to the second stage, that of resistance, in which defence and adaptation are sustained and optimal. If the stressor persists, the stage of exhaustion follows, and adaptive response ceases; the consequence may be illness and death.

To allow more precision in the discussion of stress, McEwen and his colleagues have introduced new terminology and a new conceptual framework focused on the biologic mechanisms used in coping with stress and the central role of the brain. This new framework distinguishes between the protective and damaging consequences of the response to stressors. Stressors of all varieties were initially thought to ignite a general and diffuse arousal reaction in the body. McEwen points out that through the enormous progress that has been made in research over the past half century, a very different picture of integrative physiology has emerged – one in which the social environment has a cumulative impact on physical and mental health and the progression of a number of specific diseases. **This effect of the social environment results from the fact that the brain and the body are in 2-way communication via the autonomic nervous system and the endocrine and immune systems. It is these systems that provide protection and allow adaptation in the face of acute stress, yet they also contribute to the negative impact of chronic stress and an unhealthy lifestyle.** Thus, as already mentioned above, rather than "stress," an ambiguous term that has both good and bad connotations, what most people are most concerned with when they talk about stress is that state of being better referred to as "stressed out."

Another of the key terms that has been coined in order to help clarify ambiguities associated with the word "stress," is the word "allostasis." Allostasis refers to the adaptive processes that maintain homeostasis through the production of mediators such as adrenalin, cortisol and other chemical messengers. These mediators of the stress response promote adaptation in the aftermath of acute stress, but they also contribute to allostatic overload, the wear and tear on the body and brain that result from being "stressed out." This conceptual framework has created a need to know how to improve the efficiency of the adaptive response to stressors while minimizing overactivity of the same systems, since such overactivity results in many of the common diseases of modern life. This framework has also helped to demystify the biology of stress by emphasizing the protective as well as the damaging effects of the body's attempts to cope with the challenges known as stressors.

McEwen concludes an earlier review paper along with the following -

"Health care providers can help patients reduce allostatic load by helping them learn coping skills, recognize their own limitations, and relax Two important causes of allostatic load appear to be isolation and lack of control in the work environment. Interventions that increase social support and enhance coping prolong the life span of patients."

[Note - The neuroendocrine system, autonomic nervous system, and immune system are mediators of adaptation to challenges of daily life, referred to as allostasis, meaning "maintaining stability through change." Physiological mediators such as adrenalin from the adrenal medulla, glucocorticoids from the adrenal cortex, and cytokines from cells of the immune system act upon receptors in various tissues and organs to produce effects that are adaptive in the short run but can be damaging if the mediators are not shut off when no longer needed. When release of the mediators is not efficiently terminated, their effects on target cells are prolonged, leading to other consequences that may include receptor desensitization and tissue damage. This process has been named "allostatic load," and it refers to the price the tissue or organ pays for an overactive or inefficiently managed allostatic response. Therefore, allostatic load refers to the "cost" of adaptation.] (3)

Dr. Bruce McEwen is a pioneering expert on the ways in which the brain influences the body. He is the author of "The End of Stress As We Know It" (published by Joseph Henry Press). The book examines the response of the body to stress and what happens when the body's stress response turns against us.

References:

1. McEwen BS. Stressed or stressed out: what is the difference? *J Psychiatry Neurosci.* 2005;30:315-8. (The full text version of this article can be accessed via the following link - <http://www.cma.ca/multimedia/staticContent/HTML/N0/I2/jpn/vol-30/issue-5/pdf/pg315.pdf>).
2. McEwen BS. Protective and damaging effects of stress mediators. *NEJM* 1998;338:171-9.
3. McEwen BS. Interacting mediators of allostasis and allostatic load: towards an understanding of resilience in aging. *Metabolism.* 2003;52:10-6.