The Dangers of Elevated Cortisol Levels in the Brain
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Do Physicians ever consider what goes on inside the body of the Police officer chasing a suspect? The Firefighter responding to a fire call? The Paramedic performing advanced life support?

The levels of cortisol (a potent stress hormone) in emergency personnel surge to provide energy to get them through a stressful event. But the body is designed to handle stress for short intervals, not the chronic day in and day out stress of emergency work. Is it any wonder, then, that police officers, firefighters and paramedic personnel have a higher rate of heart disease than any other group? Physical, emotional, and mental stress all elevate cortisol levels. In small amounts the body can adapt to elevated cortisol, but when cortisol stays elevated for too long it becomes deadly to every system in the body.

It is when stress becomes chronic that the body starts to breakdown. Chronic stress weakens the immune system, strains the cardiorespiratory system, damages the neurological system, and redeposits fat at the waist rather than the hips and the buttocks (a risk factor for heart disease). Chronic stress can also accelerate aging, heart disease, rheumatoid arthritis and obesity.

It was just a short time ago that leading medical researchers laughed at the idea of stress causing illness. Now thanks to the science of psychoneuroimmunology, the study of how the brain is connected to the adrenal glands and how that connection affects immunity when a person is under stress, physicians for the first time are documenting illness caused by stress. When cortisol is elevated in can cause muscle wasting along with the reduction of two of the brains calming neurotransmitters, serotonin and dopamine, affecting mood, behavior and causing depression.

For years the study of cadavers gave scientists little data, now, though, they are able to look inside the brain and monitor the stress response of live patients in real time using PET scans and a host of other neuroimaging techniques. The human body is a dynamic process in constant motion and psychiatrists, psychologists and mental health counselors will need to be retrained to use this biological model to help their patients. If an emergency worker is treated for post traumatic stress disorder (PTSD) and is only receiving counseling or narrative therapy, it may be years before any progress is noticed. But if the correct blood and saliva tests are ordered and deficiencies corrected, it could speed the healing process with less neurological damage. PTSD patients usually have high levels of circulating cortisol. Talk therapy and diet modification based on blood type, nutritional testing and customized supplementation can bring cortisol levels back to normal, increasing the brain? s feel good chemicals serotonin and dopamine.

How a person handles stress can be influenced by their job, heredity, childhood experiences, diet, blood type, exercise, sleep patterns, personal relationships, income and social status. Researches have now demonstrated that physical, emotional, and mental stress can cause illness and disease by suppressing the immune system. Stress
causes deficiencies in the disease fighting white blood cells along with vitamins, minerals, amino acids and essential fats. Adrenaline and cortisol, both stress hormones secreted by the adrenal glands, flood the blood stream during a stressful event. Stressful events, from those emergency workers face to being stuck in traffic set off a biochemical domino effect inside the body. The heart rate increases, blood pressure rises, respiration quickens, and oxygen flow to the muscles increases. If, for example, you get in an argument with someone this process kicks into overdrive. But when the stressful event is over the body sets off another group of responses that calms things down, restoring the body to normal. This process of equilibrium is essential for survival. However, as we age it becomes harder and harder to clam down after such events. That is why we see many more 60-year-old golfers than 60-year-old emergency workers. With this process in mind, think about the damaging effect a false alarm has on an emergency worker. The alarm sounds. The body is poised and ready. The brain calls to the adrenal glands and ordes the liver to bump glucose and fatty acids into the blood stream to be burned for immediate fuel. But because it is a false alarm the body never gets put into motion. The glucose and fatty acids are not burned up. They become oxidized and find a resting place in one of the worst places—the coronary arteries that feed the heart. This was one of the main reasons educated fire administrators removed loud alarms from some firefighter’s bunkrooms in the late 1970s.

This process can happen to very fit people. For instance, a man in this 40s who ran a 3 hour 7 minute marathon died when he crossed the finish line. His autopsy revealed that three arteries were 75% blocked and one was totally blocked. It was the totally blocked artery that caused the deadly heart attack. He was a very fit person who ended up with cholesterol clogging his arteries because he was under constant stress that caused nutrient deficiencies and elevated free radical damage. Free radicals are like the sparks from a fire that fall on a carpet. For the emergency worker, this carpet is their arteries. Far too many physicians confuse thinness, normal cholesterol and fast race times with health. Police, firefighters and EMS personnel must raise their own standard of care by becoming educated and requesting the new tests and treatment protocols that are currently available.

When stress persists for too long or becomes too sever, the body breaks down. Emergency workers are at the extreme end of the stress continuum and should be taken care of with new and improved treatment protocols designed for their specific metabolism. New training on stress induced nutritional deficiencies and how cortisol and free radical damage can lead to undetected heart disease should be taught in fire and police academies to ready those who work on the frontlines. In one particular study scientists placed rats in small compartments where they added loud noise and constantly changed the temperature. Cortisol levels in rats began to elevate as their stress increased. After 21 days the rats were so anxious and aggressive that their immune system could no longer fight off sickness and brain cells atrophied in their hippocampus, the area of the brain responsible for short-term memory. Emergency workers need to understand there are new risk factors that most physicians are not aware of. So when it come time for a physical, they should ask to be tested for elevations in C-reactive protein, homocysteine, and cortisol. Far too many emergency workers get a clean bill of health and told their blood tests are normal when in reality they can be dangerously close to having a heart attack. Cholesterol is not the bad guy;
it does not cause heart disease. If we train emergency workers as to how stress affects brain chemistry, immunity, heart disease and obesity, they can plug in early interventions so that they don’t have a heart attack a year after retirement.

The constant stress of emergency work is severely debilitating to the brain, heart and immune system. New studies are looking at increasing the time off for people who work in stressful occupations so they can reset their body’s immune fighting mechanism. Dr. Sheldon Cohen, professor of psychology at Carnegie Mellon University, has found that volunteers inoculated with a cold virus who reported life stressors that continued for more than one month, such as unemployment and family problems, were more likely to develop colds than those who were under less stress. The longer the stress persisted, the greater the risk of illness. The immunity of a person in their 20s is much more responsive than someone in their 40s. These critical biological differences need to be assessed so proper protocols can be established and placed in standard operating procedures in order to protect emergency personnel. These men and women daily come in contact with biohazards and their immune systems need to be functioning at peak levels.

Based on this new medical research, emergency personnel can begin to protect themselves immediately with new training in diet, customized supplementation, nutritional testing and special intravenous solutions made with Glutathione, a free radical scavenger made by the liver and depleted during stress. Glutathione can sweep away all of the dangerous byproducts floating around in an emergency worker’s bloodstream after a particularly toxic and nutrient depleting year on the job.

It seems administrators have no problem with the blood mobile parking in front of city hall so employees can give up one of the most nutritious elements in the body, the red oxygen caring blood cells. These cells take 90 to 120 days to totally replace and their loss can compound an already deficient metabolism. Yet these same administrators wonder why sick time for emergency workers is up, and they are shocked when an emergency worker request better medical care or more time off. Taking care of these men and women early with training and testing will decrease medical costs later in their careers.

Change never comes fast enough. But emergency workers on the frontlines can speed the process along by educating themselves as to how stress affects their physiology. They need to be aware of the new testing available so they can hold their medical director to a higher standard. They can start to take care of themselves today and not wait for illness to strike. Firemen, police, and paramedic personnel are in a constant state of fight or flight. Their systems never get a chance to rest. They respond to calls, drink coffee, smoke cigarettes, eat donuts and never get enough sleep. All of these habits raise cortisol levels and breakdown the genetic protection that every day fights off bacteria, virus and cancer in the body.

City and county officials who are responsible for approving policy for emergency service personnel also need to be educated as to the stress related diseases that will affect a majority of those employed in their emergency service. If a person continues to respond to calls in a nutrient deficient state they will not only damage their adrenal glands,
setting them up for chronic fatigue, but they will also damage their neurological system and cause brain damage. Dr. Joseph Le Doux of New York University states that when stress is chronic the brain is the target for damage. A decade of research has demonstrated that sustained stress and overproduction of cortisol can damage the hippocampus—the horseshoe-shaped brain structure involved in memory formation. Scientists say that the hippocampus plays an active role in registering not only events, but also their context, an important task when faced with danger. When the emergency worker is responding to a call, the hippocampus helps turn off the stress response when the call is over. But high levels of cortisol can cause nerve cells in the hippocampus to shrink and stop the creation of new brain cells. The evidence also links a smaller hippocampus with post traumatic stress disorder, depression and over training in athletes. But when was the last time a physician ordered a cortisol saliva test for an emergency worker when they were fatigued or sick? This simple and inexpensive test can be a lifesaver. The current blood work done only uncovers pathology and disease in its late stages.

City and county officials are conditioned to budget for vehicle maintenance each year. Supervisors make sure to change the oil and rotate the tires to increase the life of emergency vehicles. Now they just need that same commitment to protecting the lives of their police, fire and EMS personnel.

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