Adrenaline & the Fire-Rescue Worker

By: Gary Edwards

We've all seen evidence of it, and we have all felt it, but do we understand it? It's powerful, it's Scary, but we can control it, and we definitely can and do benefit from it.

Anyone who does public speaking or hear the ring of an alarm, tones from a pager, sirens in the distance can and will experience the effects of Adrenaline; it's natural. If given time to properly prepare, the effects of extra adrenaline flow should not be that noticeable.

Every time the alarm bell rings, or the pager goes off, and when you arrive on the scene, your Adrenaline will flow as fast as you've ever felt, that extra adrenaline starts to flow in your blood stream to help your body cope with what it will have to do.

Also called the **fight or flight response**, or the "acute stress response", was first described by Walter Cannon in 1929. The theory states that animals react to threats with a general discharge of the sympathetic nervous system. The response was later recognized as the first stage of a general adaptation syndrome that regulates stress responses among vertebrates and other organisms. In layman's terms, an animal has two options when faced with danger. They can either face the threat ("fight"), or they can avoid the threat ("flight").

As firefighter, we rely on this reaction to do out job and face the threat in hand.

The onset of a stress response is associated with specific physiological actions in the sympathetic nervous system, both directly and indirectly through the release of epinephrine and to a lesser extent norepinephrine from the medulla of the adrenal glands. The release is triggered by acetylcholine released from preganglionic sympathetic nerves. These catecholamine hormones facilitate immediate physical reactions by triggering increases in heart rate and breathing, constricting blood vessels in many parts of the body—but not in muscles (vasodilation), brain, lungs and heart (increasing blood supply to organs involved in the fight)—and tightening muscles. An abundance of catecholamines at neuroreceptor sites facilitates reliance on spontaneous or intuitive behaviors often related to combat or escape.

Normally, when a person is in a serene, unstimulated state, the "firing" of neurons in the locus ceruleus is minimal. A novel stimulus (which could include a perception of danger or an environmental stressor signal such as elevated sound levels or over-illumination), once perceived, is relayed from the sensory cortex of the brain through the thalamus to the brain stem. That route of signaling increases the rate of noradrenergic activity in the locus ceruleus, and the person becomes alert and attentive to the environment.

If a stimulus is perceived as a threat, a more intense and prolonged discharge of the locus ceruleus activates the sympathetic division of the autonomic nervous system (Thase & Howland, 1995). The activation of the sympathetic nervous system leads to the release of norepinephrine from nerve endings acting on the heart, blood vessels, respiratory centers, and other sites. The ensuing physiological changes constitute a major part of the acute stress response. The other major player in the acute stress response is the hypothalamic-pituitary-adrenal axis.

It is a drug used as a heart stimulant and muscle relaxant.

Any shock or surprise can initiate an adrenaline rush.

(Expect it)

Use it to your benefit.

We must all be crazy, we run into burning buildings when even the cockroaches are running out. We routinely do abnormal things. We should expect that our bodies won't understand.

Adrenaline Friend or Foe

The Fire-Rescue worker must learn to use Adrenaline to his or her benefit.

It will be present, and it can be an ally, but it can be an enemy.

We've all seen the fire fighter run up to the scene and start ripping things apart; this usually ends up badly.

Calm rational thinking is imperative to the successful completion of any task and even more on the scene of an emergency where nothing is normal and many things can happen unpredictably. Remember all other people on the scene are fighting a rush of adrenaline, and their actions may be influenced by this as well.

Several things can be done to keep our adrenaline flow in check:

1. Volunteers, have your clothes ready by the bed at night.
2. Volunteers, put your gear on before arriving on scene (prepare so this is easy) Suspenders? Chin strap?
3. Walk, don't run.
4. Take the time to think things out carefully (pre-plan/size-up)
5. Take mental notes of the whole scene (What else is going on besides your task? What are others doing? This can eliminate surprises.)
6. Officers should be aware of those having difficulty handling Adrenaline rushes and coach as required.

Our normal lives don't involve too many surprises and this allows us to normally function calmly, but a bunch of surprises thrown at us all at once can throw our mental capabilities into turmoil.

Adrenaline flow will be increased in the most experienced Fire-Rescue worker, but it can be channeled to add physical and mental strength as required.

- Hauling hose
- Pumping hand operated hydraulic tools
- Lifting things (caution: within reason)

Remember Adrenaline is flowing in victims as well, so make sure they agree with and understand your actions.

E.g. many drowning victims have grabbed onto a rescuer in a "death grip" that can actually drown the rescuer.

Don't go home and try to go to sleep right after a stressful situation. Critical Incident Stress debriefing can help (formal or informal).

Expect a wind down period as your body uses up the excess of adrenaline pumping through your system. Go have a coffee, talk about it, and relax, as in a critical incident stress debriefing.