

**Trust Your Endorphin Feelings**  
**Brittany Peters**

What motivates ultramarathoners to lace up and run until they are beyond the point of exhaustion? How are cyclists able to endure hours of uphill riding? Why do endurance swimmers strive to swim further distances? Endorphins. They are located in the brain, travel through the bloodstream, numb pain and allow athletes to feel invincible in the midst of their workout. Endorphins are released in proportion to the level of physical exertion during exercise, and have been described as being more potent than illegal drugs such as morphine, heroin and opium. Endorphins are physiologically present in increased quantities during strenuous physical activity, and are the most important factor in creating the sensation of well-being.

Endorphins physically exist in humans. They have been scientifically detected at the molecular level in the body. Endorphins are produced in the hypothalamus portion of the brain (Zumerchik 359). The hypothalamus is responsible for reactions to pain and pleasure. It also regulates the functioning of the pituitary gland (Miller 463). Therefore, the hypothalamus is responsible for the release of endorphin, which has an influence on pain. Endorphins exist in the body, because they have an important biological function to carry out. Their role is to overcome physical pain. Endorphins are released as small-chain peptides (“Endorphins”) by the pituitary gland (Weight). As pain signals are more frequently directed to the hypothalamus, the release of endorphins become more concentrated. There are two methods of pain suppression: Firstly, the proteins stimulate opiate receptors. This creates a sleep-like effect. Endorphins also bind to brain and nerve cell receptors (Zumerchik 359). If enough endorphin chemicals bind to nerve cells, there is a decreased likelihood of the pain messages being sent to the brain. Clearly, endorphins are naturally manufactured and present in the human body.

Endorphins are released when the body experiences strenuous and continuous exercise. The logical cycle of endorphin release directly reflects the physical effects of intense physical activity. The transport of endorphins are dependent on blood flow. As athletes settle into a rhythmic jog or swim, their heart rate increases. As a result, the rate of blood flow also increases. Endorphins exist in the blood (Zumerchik 359). Therefore, they are able to take a stronger tonic effect throughout the body, when heart rate and blood flow increase. For this reason, an athlete experiences stronger side effects of the natural endorphins when the intensity of their work out is increased. As an athlete approaches his peak level of exertion, endorphins travel faster throughout the body, and more individual proteins are produced to effectively stimulate opiate and nerve receptors, which overcome the physical pain (Zumerchik 359). Endorphins are a body's natural pain killers. Some elite athletes are repetitively involved in strenuous and continuous exercise, yet they claim to never experience the endorphin "high." This is because endorphin release is unique to each individual. Some athletes, at the extreme end of the continuum, release endorphins after thirty minutes of exercise, at 75% of their maximum heart rate. Others, in the middle of the continuum, release endorphins after only two or more hours of an intense work out at 75% of the maximum heart rate (Zumerchik 359). Endorphins are not produced immediately nor easily. This is a common reason for disbelief in the natural production, release, transport and effects of beta-endorphins. The level of endorphins released by the body increases as the heart rate and stress level also increase.

In significant quantities, endorphins are so strongly effective that they create a drug-like "high," and are the most important factor in the sensation of well-being. The side effects of endorphin release have the potential to be so exhilarating, that they are considered to be stronger than a variety of illegal drugs. According to the researchers of *Peak Performance Online*,

natural endorphins are more potent than morphine, heroin and opium (Weight), all of which are strictly prohibited by the federal government and local laws. Endorphins also possess certain characteristics of intoxicating drugs. For example, endorphins are physically addictive. Once experienced, a person will likely be compelled to take on tougher athletic challenges so as to increase this chemical reaction in the brain (Fletcher). A person may crave the natural high, and even develop an obsession for the physical side effects associated with the chemical. Endorphins arouse mental addictions, similar to the side effects of some synthetic drugs. Bee Peta, a reporter for *The Times*, writes, "The release of the body's natural feel-good chemicals, beta-endorphins...[have] a profound anti-depressant effect on the brain." Endorphins create sensations of enlightenment. Athletes may crave the mental side effects after even one intense experience of endorphin release. Endorphins also replicate some of the negative side-effects of various illegal drugs. Once the "high" has worn off, individuals often experience withdrawal symptoms, such as depression (Fletcher). Another reason why athletes strive to push themselves further and work out more often, is so that they can avoid the withdrawal symptoms involved with the chemical release. The effects of endorphins are similar to those of addictive synthetic drugs, and as such, are responsible for the sensation of euphoria during strenuous physical activity and withdrawal afterwards.

During vigorous exercise, endorphins not only numb physical pain, but they also reduce stress hormone levels in the body. Sensations of well-being result from the reduction of physical discomfort caused by the actual exercise, as well as the suppression of cumulative mental and emotional distress. Currently, researchers are discovering that an increased production of beta-endorphins rids the bloodstream of stress hormones (Peta). Stress hormones are released in response to high pressure situations, stressful work environments, and difficulties

in marriage, and other relationships. This theory has been proven to be so accurate and significant, that informed individuals are adopting a more active lifestyle for this reason. For example, the prevalence of employee work out rooms in large companies is becoming increasingly common. Employers are finding that vigorous exercise releases tension in their staff (Peta). This benefits companies, because employee morale and production consequently improve during working hours. There is also less interpersonal conflict and greater attention given to performance of individual tasks. Endorphins provide many benefits for an athlete both mentally and physically, as well as emotionally. The release of endorphins during strenuous physical activity creates feelings of well - being, because the concentration of stress hormones in the bloodstream decreases in kind.

The sensations of euphoria experienced by athletes after intense feats of endurance and strength are caused by beta-endorphins, which are physically produced by the body during vigorous physical exercise. Endorphins have been proven to exist in the brain, and they numb physical pain by binding to brain and nerve cell receptors. On a molecular level, they have been declared more potent than certain synthetic illegal drugs, and produce similar addictive side effects, as well as symptoms of withdrawal. Endorphins also reduce psychological pain by ridding the bloodstream of stress hormones. It can be seen that there is plenty of evidence to support a willingness to get off the couch and into workout attire. Stress and lethargy will be replaced with a sense of well - being and vitality- not to mention the added benefits of improvements to one's physical appearance and fitness.

## Works Cited

- 'Endorphins'. Pharmacology Central. Online. Internet. 30 Nov 02.  
<http://www.pharmcentral.com/endorphins.htm>
- Fletcher, Victoria. 'Harder They Run, Faster They Fly'. The Times. Mar 99. Proquest Direct. Online. Internet. 18 Sept 02. <http://www.proquest.com/proquest>
- Miller, B., and C.B. Keane. 'Hypothalamus'. Encyclopedia and Dictionary of Nursing and Medicine. Philadelphia. W.B. Saunders Company, 1972, 463.
- Peta, Bee. 'How Stress Can Take It's Toll on the Body'. The Times. Aug 01. Proquest Direct. Online. Internet. 3 Oct 02. <http://www.proquest.com/proquest>
- 'Weight Trainers Miss Out on the Runner's High'. Peak Performance Online. Online. Internet. 18 Sept 02. <http://www.pponline.ca/uk/encyc/0430.htm>
- Zumerchik, John. 'Runner's High: Fact or Fiction?'. Encyclopedia of Sports Science. John Zumerchik ed. Vol 1. New York: Simon & Schuster Macmillan, 1997, 359.

