

Muscle fatigue essay sample

[Health & Medicine](#), [Body](#)



Muscle fatigue is weakness or weariness resulting from exertion or prolonged stress and the failure to maintain an expected power output. (Amussen) The process by which your body produces energy is called glycolysis. During glycolysis, glycogen is broken to produce creatine phosphate, which releases energy. The energy released catalyzes a reaction to produce ATP. The ending product of glycolysis is lactic acid, which is created by breaking pyruvate acid down. Then lactic acid is broken down to produce lactate. For each compound of lactic acid that is formed the cell gains a lactate compound and an H⁺.

The increase of H⁺ in a cell causes the pH to decrease, which causes the cell to become acidic. The acids in muscles cause the fibers' calcium-binding capacity to decrease, which then limits muscle contraction, which causes muscle fatigue. (Mullick) During muscle fatigue, feedback of nerve impulses from the fatigued muscles interrupts on a part of the reticular formation and causes a hang-up of voluntary effort. (Amussen) It is important to understand that muscle fatigue results from metabolic reasons and not structural changes in your muscle.

Peripheral muscle fatigue involves the motor units, such as motor neurons, peripheral nerves, motor endplates, and muscle fibers. There are two different sites where repeated contractions may cause muscle fatigue. One is the transmission mechanism, which is basically the neuromuscular junction, muscle membrane, and endoplasmic reticulum. The other one is the contractile mechanism, which is the muscle filament. A muscle fiber's mechanical response declines with fatigue. Peripheral muscle fatigue is caused by changes in the internal conditions of the muscle. The changes can

be biochemical, depletion of substrates, high-energy phosphate compounds in the muscle fibers, and acetylcholine in the terminal motor nerve branches, or they may be caused by the accumulation of metabolites. (Amussen)

Central muscle fatigue involves motor neurons that are mainly located in the brain, but it is also located in the spinal cord. It is caused by an inhibition obtained by nervous impulses from receptors in the fatigued muscles.

(Amussen) It results from a weakened function of the central nervous system. A decrease of blood sugar glucose increases fatigue in central muscle fatigue. Central fatigue may also result from temperature changes that alter nerve transmission, dehydration, and general discomfort. (Creel)

Central muscle fatigue does not affect your muscle but it lowers your capacity to perform. (Fink)

Factors that cause fatigue vary based on the type of muscle or the exercise. They depend on the blood vessel supply, amount of myoglobin, myosin molecules that split ATP at a rapid rate, and the speed of contraction. Low ATP, high lactic acid and slow twitch fibers that release acetylcholine slowly are other factors also. (Creel) Physical fatigue may occur because of a disease, pain, anemia, being less active or other health problems. (Matsen) All of these things are taken into consideration when figuring out how your muscle fatigue was used.

Muscle fatigue has its negative and positive consequences. Fatigue could result in the loss of muscle force. It will also cause general discomfort. A positive consequence is that it prevents overuse of the muscle. It also prevents respiratory failure.

For sports athletes gradually condition training is recommended. Also, an athlete can prevent muscle fatigue by knowing their limits. A treatment for fatigue or an exact cause of fatigue hasn't been found yet. A lot of research has been done and scientists are working hard to find out what causes fatigue.