Effects of Immobility

By Glenn Rexroad

1. In as early as the 1860's Dr. Hilton claimed that complications increased with immobility and became severe with prolonged immobility. The current belief was that only the pathology could cause further complications

2. When people can not perform normal everyday tasks they eventually perceive themselves as being sick and dysfunctional. This produces a mental out look that psychologically affects their physiological well being.

3. The physiological effects of immobility on the structure of the musculoskeletal system create a positive feedback loops that affects other systems. This domino cycle adversely affects other physiological functions, which in turn produces other physiological dysfunctions.

4. When physical activity is decreased endurance is decreased, energy is decreased, and fatigue and weakness set in. With these symptoms people tend to decrease activity even more. A positive feedback loop is created which causes a domino effect. Less activity leads to further symptoms of decreased endurance, decreased energy, fatigue and weakness. And so on.
The only way to break the positive feedback loop is to increase mobility and activity thus breaking the cycle.

5. Immobility can be voluntary or prescribed. A cast for a broken bone is prescribed immobility.

6. Voluntary or self regulating immobility is limiting activity due to a sprain or strain.

7. An intact nervous system, intact muscular system, intact skeletal system, intact vestibular system, and an intact proprioceptive system are needed components to produce proper mobility or movement. Through the integration of these systems sensory information should product some type of motor response.

8. As a result of long term immobility bones are also affected. Bones are constantly stimulated by movement from the muscular system. Decreased movement subjects bones to decreased blood and nutrients. This leads to decreased bone density, called osteoporosis, and the bones become brittle.

9. Immediately following an injury a functional decrease in movement is experienced. This causes a decrease in circulation leading to decreased oxygenation of soft tissue, decreased red blood cell production, decreased basil metabolic rate, and decreased muscle mass. In fact a decrease in circulation leads to chemical ion loss resulting in degeneration of all tissues throughout the body.

This is why a neuromuscular treatment plan that incorporates an increase in range of motion and therefore an increase in movement needs to be put into effect immediately following an injury.

10. Decreased movement leads to decreased cardiac output. This results in decreased circulation. Decreased circulation can lead to hypotension (low blood pressure) due to baroreceptors receiving less pressure changes in the blood stream. Although low blood pressure at first sounds good it actually causes the person to feel fatigued, tired and low on energy.

11. The respiratory system is affected by decreased movement. A decrease in oxygen intake causes a decrease in cellular respiration. There is a decrease in tissue oxygenation and a build up of carbon dioxide in the blood stream.

12. The genitourinary system is affected by decreased circulation caused by decreased movement. Urine pH changes affecting calcium levels that may create hypercalcuria and kidney stone formation, as well as bladder infections.

13. The endocrine system is affected by decreases movement. Decreased endocrine system function results in decreased release of hormones further decreasing muscle tissue and decreased insulin binding decreases cellular energy.

14. The gastrointestinal system is affected. Decrease ROM causes decreased circulation causing imbalance of nitrogen affecting amino acids needed to produce ATP, the body's source of energy. Calcium absorption is decreased leading to further bone loss. Also, decreased circulation due to decreased movement leads to cellular fluid shifting, creating edema (inflammation). And inflammation equals pain.

15. Decreased ROM causes decreased needed signals to the brain causing neurological symptoms which include depression, anxiety, confusion, disorientation, increased dependency on neuron stimulants like caffeine as well as decreased balance and coordination.

16. Movement is critical to all components of the body. Since muscle contracture can occur in as little as 5-7 days, a comprehensive neuromuscular treatment plan that restores proper ROM and movement patterns should be implemented immediately. And muscular components must be maintained to insure that muscles stay in balance and proper movement continues. My treatment program designed to increase ROM and mobility and incorporates increased activity in order to accelerate resolution from injury.

Information taken from Dr. Kevin Ryan, M.D.