

Spinehealth and Disease

The Injured Spine

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An injury is defined as damage or harm to an individual or bodily region caused by a person, a situation or a thing. An injury may result from physical trauma induced by another individual, a movement, a task or the result of a vehicular accident. Spinal injury usually involves compromise of spinal tissues to varying degrees. The most common injury to the spine is the strain/sprain. If the supportive elements of the spine are compromised such as the ligaments this results in greater injury to other tissues such as the intervertebral disc and spinal joints. Trauma can be classified as microtrauma or macrotrauma.

Microtrauma:

The term microtrauma refers to small injuries which often go unnoticed at the time of injury. Diagnostic studies will often not reveal the injury. Repetitive microtrauma can lead to the development of significant tissue compromise and symptoms. Microtrauma can occur in any tissue of the body including the tissues of the spine. Repetitive microtrauma is sometimes referred to as a cumulative trauma disorder (CTD).

Microtrauma can include the microtearing of muscle fibers, the sheath around the muscle and the connective tissue. It can also involve injury to tendons and to bone. Most microtrauma results in a low level of inflammation that is often not associated with any signs or symptoms. Repetitive microtrauma which is not able to heal or is not allowed adequate time to heal can result in the development of more serious problems. Tissues which have an absent or poor blood supply such as the intervertebral disc do not recover well from a microtrauma. The more limited the blood supply the longer a tissue takes to heal. If a tissue is not able to fully recover it is subsequently left more vulnerable to the next set of circumstances which might lead to additional microtrauma.

Back pain can develop as the result of cumulative microtrauma brought about by isolated injury or repetitive activity over time. Examples of microtrauma include heavy lifting, a fall, athletic injuries, strains/sprains and prolonged sitting. Weight management and regular exercise helps provide stability to the spine and will help reduce the incidence and impact of spinal microtrauma. For this reason therapeutic exercise is an important factor in reducing the incidence of back pain. Microtrauma of tissue which has the ability to heal and is allowed to heal can result in tissue repair and remodeling with stronger and more capable replacement tissue. A good example of this is the effects of progressive exercise on muscle tissue.

Macrotrauma:

The term macrotrauma refers to tissue injury which is recognized with associated symptoms. There is typically a known mechanism of injury and there are associated signs or symptoms. The individual is usually aware of when the injury occurred because of the onset of immediate symptoms. The tissue recovery period is longer than with microtrauma.

Cumulative microtrauma renders underlying tissue vulnerable, therefore, setting the stage for greater tissue injury with trauma of the magnitude to be considered a macrotrauma. Macrotrauma is more likely to involve compromise of multiple tissues than microtrauma.