What is the Matrix?

Each cell in the body has a molecular framework called the cytoskeleton which determines the shape and function of the cell. Donald Ingber[1] has demonstrated that changes in the shape or tension of the cytoskeleton will have a significant effect on the function of the cell. The cell covering has special proteins which give shape within each cell and in 1981 Steven Levin[2] proposed that the cells' network is interconnected throughout the entire body. This was later confirmed by Huijing[3] in 1999. This is the tensegrity matrix.

Understanding the matrix helps us to understand how the body moves and responds to mechanical forces. This all has an influence on health and disease. Because of the matrix the body is resilient and can perform many activities and handle a significant amount of force without side effects. But there is a limit when the forces are too much for our structure to absorb.

When a person is involved in a fall, strain, MVA, the molecules that make up the matrix can become locked into a rigid pattern. In every cell of the body there are a series of tiny cables and struts made of protein. These protein strands form a framework which gives the cell strength and flexibility. If a significant force is applied to the body in the way of injuries such as a severe strain or impact, the matrix will absorb some of the force or energy. This will alter the arrangement of the molecules within the protein fibers. This area will become rigid and create a primary restriction.

Our body consists of cell, tissue and organs that form a network; therefore, one or more primary restrictions can produce a pattern of tension that will affect the entire body. If you pull the corner on one side of a fabric, the whole fabric will become distorted, the lines of tension will radiate from the pulled area. Likewise, the pattern of tension from a primary restriction will cause the body to strain and move abnormally. The pain that is reported is due to this transmitted tension causing strain in other regions of the body, usually away from the primary restriction. As a person incurs more injuries and more primary restrictions, layers of tension will be added causing the matrix to become more and more restricted. You must also keep in mind, the area that already has a primary restriction is less flexible than normal tissue, therefore, subsequent injures will tend to be absorbed by this area and create a larger area of restriction. The more out of balance the matrix is, the more likely it will create strain and pain. The matrix is strong and resilient and is capable of withstanding forces. But, once it reaches a certain threshold, the forces are absorbed by the proteins which form the cellular framework.

There are two major types of injury: strains and impact. Contact sports, falls and MVA are the most common types of impact injuries. According to physics we know that the denser a substance is the more mechanical energy will be absorbed from that impact. The molecules in a dense structure are close together, the force of the impact is easily transferred from molecule to molecule. Water is the densest substance in the human body. It is referred to as non compressible substance which means the molecules can't be pushed any closer together than they already are. The water molecules in a water balloon cannot move any closer than they already are. If you drop it, the energy from the impact is transferred to the water molecules inside the balloon which converts the molecules to movement. The only way the molecules can move is outward. Burst! The body is 70% water, most of which is between blood vessels and intercellular spaces. There are certain organs in the body where water is contained and cannot easily disperse. These are the fluid filled organs like the heart, liver, spleen and kidneys. If the force is significant, it will cause a rapid outward movement of the water molecules inside the organ. This causes a sudden internal expansion which causes a direct transfer of the force from the injury to the organ itself and the surrounding structures.

Strain is an overstretching of tissues which can involve muscles, ligaments or joints. The body has elastic properties that can resist some strain. But if a significant force is incurred or if an area has lost some of its elastic properties the force of the strain is absorbed into the tissue which causes a permanent change in the molecular structure. Scar tissue is developed by the body to replace damaged cells and tissues. It is a dense grouping of cells surrounding inelastic fibers. Scar tissue is less elastic than normal tissue and can cause a primary restriction.

The Solution!

The area of primary restriction is often painless soon after the original injury. But the parts of the body trying to compensate becomes strained and painful. If we treat the site of pain the problem can reoccur. If manual treatment is applied to the primary restriction, the normalizing electrical field in the therapist's hands can shift the injured area towards normal. This can happen by causing a discharge of the stored electrical charge within the tissue which in turn causes a return of the tissue to the neutral, relaxed state of the molecular structure. The entire body must be assessed for the possibility of primary restrictions. The body then is restored to balance. A decrease in pain is often the result because the strain is reduced and normal tone is restored to the tissues of the body.

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