

**Artificial Disc Replacement**  
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Artificial disc replacement is a procedure in which a degenerated intervertebral disc is replaced with a prosthesis, which preserves the natural movement of the spinal column while relieving severe pain and restoring neural function.

Intervertebral discs are located on the spinal column in between each vertebrae. Each disc is composed of two parts: the nucleus pulposus and the annular fibrosis. The nucleus pulposus is the inner gelatinous like substance which gives the disc elasticity and compressibility. The annulus fibrosis surrounds the nucleus pulposus and is composed of collagen fibers and fibrocartilage and provides strength and stability to the spinal column.

The main function of intervertebral discs is to absorb shock and loads distributed to the spinal column, which may be experienced during walking, running and other movements. Physical trauma to the spine such as lifting heavy objects incorrectly and general wear and tear on the spine may cause disc degeneration.

In a majority of cases disc degeneration trauma such as a herniated disc may be treated with non-surgical procedures such as physical therapy, pain medication, exercise, massage etc. However in severe cases surgery may be required.

Currently a common surgery to treat severe cases of disc degeneration is spinal fusion. In this procedure bone is grafted from a site on the patient (usually the hip bone) and encouraged to grow on the spinal column fusing the two vertebrae together. However this procedure causes reduced mobility and increased load at the level of fusion. Increased load may cause disc damage at other levels leading to further injury.

One alternative to spinal fusion is to use an artificial device which mimicks the intervertebral disc's function. By removing the intervertebral disc and replacing it with a functional prosthesis, the patient retains his/her spinal mobility.

The Link Charite SB III is one such intervertebral prosthesis designed to do just this. The SB III, developed in Germany, is their third iteration of a spinal prosthesis which they have been developing since the mid 1980's. It is a relatively simple device composed of a polyethylene