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### **Spinal Replacement with the CHARITE Artificial Disc**

Throughout our lives we have all experience some form back pain. Sometimes we get out of bed to fast or lift an object that is far too heavy but the pain goes away within minutes.

A person that suffers from Degenerative Disc Disease (DDD) will experience a far greater intensity of pain for a longer period. DDD occurs in many people during the normal aging process. It is sometimes referred to arthritis of the back and is most common at the L4-L5 and L5-S1 levels.

In between each vertebra is a fibrous bundle of tissue called an intervertebral disc, which acts as a cushion to the spinal column by absorbing shock and pressure associated with everyday movement. Over time, the normal aging process causes the intervertebral discs to degenerate, diminishing their water content and thereby reducing their ability to properly absorb the impact associated with spinal movements.



In October 2004 the CHARITE artificial disc was the first disc approved for disc replacement use in the general population of back pain patients in the U.S. By using this disc, the biomechanics of spine will not be affected. The patient will not be able to tell that they have an artificial disc in them. The only thing noticeable will be the release of pressure and pain.

The CHARITE artificial disc (DePuy spine, Inc., a Johnson and Johnson company), is composed of two metallic endplates and a polyethylene core that moves between them. During the surgery, the patient's degenerated disc is removed and a pair of endplates made of cobalt chromium are inserted in the space between the vertebrae and attached to the vertebrae above and below the disc. A polyethylene material is then inserted between the plates to create a disc-like structure that mimics the normal disc. This provides both a normal level of separation between the vertebrae and allowing the usual range of motion and flexibility for that segment of the spine.

#### References:

1. <http://www.regence.com/trgmedpol/surgery/sur127.html>
2. <http://www.charitedisc.com/>
3. <http://www.spine-health.com/research/discupdate/discupdate01.html>
4. [http://www.spine-health.com/topics/cd/degen/feature/w\\_degen01.html](http://www.spine-health.com/topics/cd/degen/feature/w_degen01.html)
5. Trouillier H, Kern P, Refior HJ, Muller-Gerbel M. A Prospective morphological study of facet joint integrity following intervertebral disc replacement with the CHARITE(trade mark) Artificial disc. European Spine Journal 2005 Sept 7. PMID: 16151716