

Artificial Disk Replacement in the Lumbar Spine

Trevor Bernier, *Biomedical Engineering, University of Rhode Island*
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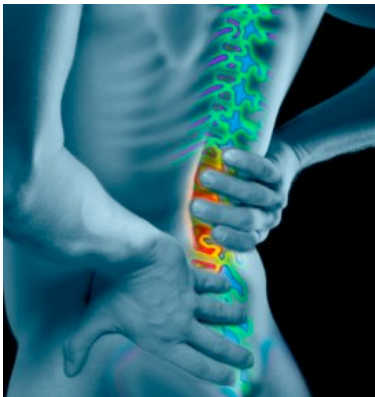
Abstract—This paper outlines the current state of technology with regards to artificial disk replacement in the lumbar spine. There are multiple different designs and several methods used to help relieve lower back pain. This paper will focus on disk replacement.

I. INTRODUCTION

ARTIFICIAL disk replacement is one of the best solutions for lower back pain. Lower back pain is a significant cause of discomfort and disability in the U.S. and worldwide. It is estimated that 70-80% of people will experience lower back pain sometime in their lives. Artificial Disk Replacement can be extremely beneficial in relieving this pain and helping people return to work and be comfortable again.

II. WHY ARTIFICIAL DISK REPLACEMENT?

Lumbar Fusion technology is the more popular method for treating lower back pain, but there are some disadvantages to this method. Results vary with lumbar fusion and no two cases are ever alike. Some patients who go through lumbar fusion see no improvement at all. Lastly, lumbar fusion can restrict the normal movement of the patient's body.

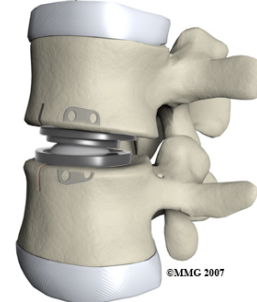


With these disadvantages to the other technologies, Disk Replacement becomes a great alternative.

III. WHO IS ELIGIBLE?

Patients are eligible when back pain is caused mostly by 1 or 2 disks in the lumbar spine. Also when the patient has no joint disease or bony compression on nerves and is not excessively overweight. They need to have had no surgeries in the lumbar spine area and no scoliosis or other deformities of the spine. The main reason for getting lumbar disk replacement is degenerative disk disease.

Lumbar Artificial Disc Replacement



IV. DISK DESIGN

The newest models replace the whole disk including annulus and nucleus. There are many designs, but they all look to fix the problem, stay the same size and keep functionality. Like knee and hip replacements, they are made from metals and plastics



REFERENCES

- [1] McAfee, Paul C. The indications for lumbar and cervical disc replacement. *The spine journal* 4.6 supply Nov 2004: 177S-181S. Elsevier. 29 Oct 2012
- [2] Freeman, Brian J. C. Total disc replacement in the lumbar spine: a systematic review of the literature. *European spine journal* 15.s3 Aug 2006: 439-447. Springer. 29 Oct 2012.
- [3] Mayer, Total lumbar disc replacement. *Journal of bone and joint surgery*. British volume 87.8 2005: 1029. Published for the British Editorial Society of Bone & Joint Surgery by Churchill Livingstone. 29 Oct 2012.
- [4] http://www.google.com/imgres?q=back+pain&um=1&hl=en&client=safari&sa=N&rls=en&authuser=0&biw=1369&bih=653&tbn=isch&tbnid=ajQ1RQ2guEfrlM:&imgrefurl=http://backpain.stanford.edu/&docid=0AdYs19iUkmEnM&imgurl=http://backpain.stanford.edu/images/backpain_000.jpg&w=359&h=288&ei=SU2IUJ_u18W10QHD0YDIAQ&zoom=1&iact=hc&vpx=1042&vpy=163&dur=283&hovh=142&hovw=156&tx=150&ty=67&sig=116993608161387744880&page=1&tbnh=142&tbnw=156&start=0&ndsp=23&ved=1t:429,r:6,s:0,i:155