



SENIOR DESIGN ORGANIZATION SYNOPSIS – SPRING 2013

EXPANDABLE SPINAL CAGE CRIDOME ENGINEERING INDUSTRIES

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Spinal cages are fairly new in the medical world and seem to be a formidable opponent to the age old occurrence of spinal disk problems. The purpose of a spinal cage is to realign the spinal column and restore lordosis after any number of common spinal disk problems. These typical spinal conditions can range from degeneration of a disk, bulging disk, herniated disk, thinning disk to even degenerated disk with osteophyte formation which is bone formation at the joining end. The spinal cage corrects these problems by replacing the damaged disk through posterior or anterior minimally invasive surgery. Anterior methods have proven to be the most effective method for placement. This is simply because spinal muscles can be left intact and due to the low impact surgery methods associated with minimally invasive surgery recovery time is drastically accelerated. The cage corrects these problems by fusing the upper and lower vertebrae associated with the damaged disk. It will limit movement between these two portions but will restore over all movement and drastically reduce pain caused by these damaged disks.

With these devices making leeway in the medical world it was paramount that the most important issue be addressed. That is that no two human beings on this planet are the same in any way shape or form. With that being said as a company our problem is to design an adjustable spinal cage that will not only address the known fact that we are all unique, but will also limit the need to fabricate a one of a kind cage for a given person which will greatly increase the price. The problem just doesn't stop there though. As this will be a completely new medical device filled with its unique complexities, we must also develop the medical tools that will install the device and adjust it. The human body is a tricky and complex system and great care must be taken in how we approach this problem. With the obvious problems and concerns addressed we can focus on another that is necessary for our devices success. That would be the material of the cage and tools and more importantly the method in which the device should be installed. There are many avenues of approach when dealing with this but one thing is certain, that extensive research must be done and the proper medical officials must be interviewed and granted access so that all our bases are covered so to speak.

In conclusion, if successful with a complete and working adjustable spinal cage and required materials, not only will it advance already used methods and devices it will greatly impact the coined term "one size fits all". The device won't actually fit that descriptions per say



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but it will bring the world one step closer to it. Lastly, the most important question that one may have is how spinal cages can be developed by mechanical engineers. The answer is simple at that, as this device is more mechanical in nature and of simple design, with related models already in use and under development by mechanical engineers. We as a whole have been ensured under proper guidance that our company is well within its boundaries to develop such devices in which we gladly accept the challenge.