Abstract – The purpose of this study is to research and learn more about Functional Electrical Stimulation (FES) and its many different applications, and present this information to the Biomedical Engineering Seminar II class.

Introduction
In today’s world, technology is constantly progressing at an exponential rate. However many of these advancements in science and technology are still in the making and are either not available for the public or are too expensive for the common man to afford. Functional Electrical Stimulation is an easily accessible, affordable, non-invasive form of technology that can have some serious results in the restoration of the nervous system. FES is a technique that uses electrical currents in the human body to interact with nerves innervating extremities affected by paralysis to restore function in these areas. Thus problems from spinal cord injury (SCI), head injury, stroke and other neurological disorders can be partially restored and aided. It is primarily used to restore function in people with disabilities, but is a broad field of study and can be used for many more things.

Early History
Functional Electronic Stimulation was first used in 1961 and it was originally referred to as Functional Electrotherapy by W.T. Liberson. It wasn’t until 1967 that the term Functional Electrical Stimulation was introduced by Moe and Post. Foot Drop was one of the first applications to become commercially available and used on a wide scale.

Applications
There are many applications in the FES field, but some of the major ones are the foot drop, freehand system, bionic glove, odstock 2 & phrenic stimulation.

Limitations
The major limitation of FES is the fact that it does not cure or fix any of the disabilities it deals with, only offers a temporary spark in the nervous system to give a sense of muscle control. Also there is a chance for muscle tears, blisters, burns, dizziness, and autonomic dysreflexia.

References


