Functional Electrical Stimulation (FES) to improve walking for people who have had a stroke

Dropped foot is the reduced ability to lift the foot as it is brought forward while walking. Dropped foot also affects the position of the foot in weight bearing, increasing the risk of 'turning your ankle'. It is a common problem for people who have had a stroke and can significantly reduce the safety, confidence and efficiency of walking.

A dropped foot may be present all the time or may only become a problem when the person is tired after walking a distance. People who have had a stroke may also experience weakness in other muscles, for example, the muscles which bend or straighten the knee or extend and flex the hip.

What our FES users say...

"It is impossible for me to overstate the benefits FES has for my life."

What is Functional Electrical Stimulation (FES)?

FES is a non-invasive treatment which uses small electrical impulses to activate weak or paralysed muscles by stimulating the nerve. FES can be used to improve walking, hand, arm and shoulder function and is used as a take home therapy for daily use.

Self–adhesive patches (electrodes) are placed on the skin close to the nerve supplying the muscle. Leads connect the electrodes to a stimulator which produces the impulses. For most users stimulation feels like mild pins and needles which they quickly become used to.

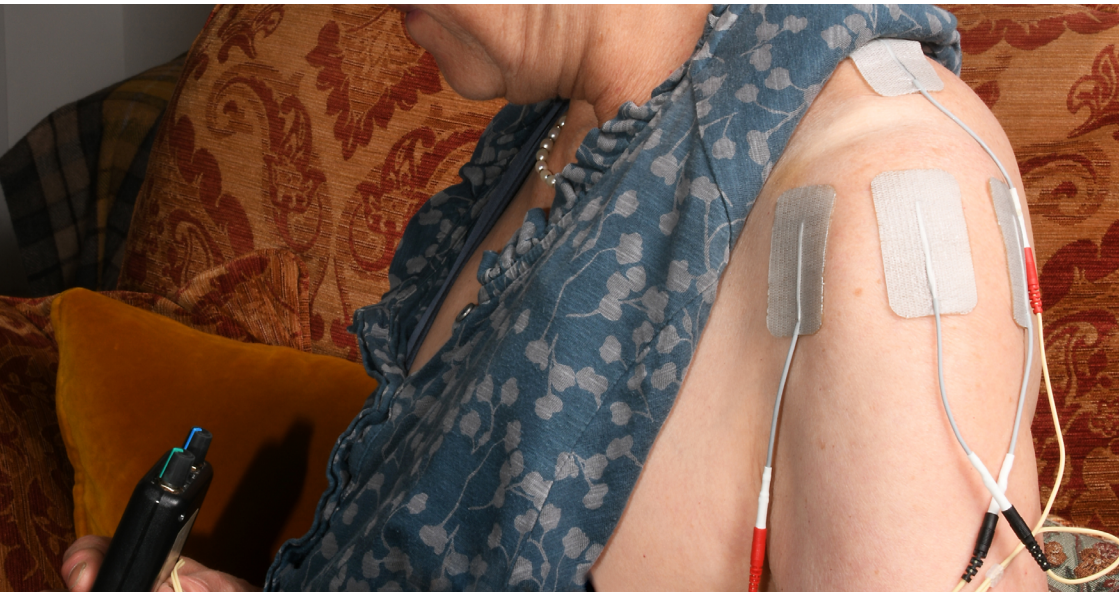
For correction of dropped foot, the common peroneal nerve is stimulated on the side of the lower leg, using a device called the ODFS® Pace. This causes the foot to lift. Stimulation is timed to walking using a pressure sensitive switch in the shoe, turning the stimulation on and off at the correct time. In the same way, muscles that control the hip and knee can be stimulated to assist walking.

FES has been shown to have the following effects:

- Walking is safer and falls are reduced by an average of 72%
- Walking is faster
- Walking is more efficient, requiring less effort
- Walking is more automatic, requiring less concentration
- FES users report they are more confident while walking

The Royal College of Physicians have published their updated National Clinical Guidelines for Stroke for the UK and Ireland. These include improved recommendations for rehabilitation and in using FES.

National Clinical Guideline for Stroke (strokeguideline.org)



FES for shoulder, hand and arm

FES can be used to strengthen the muscles that control the shoulder, hand and arm. This may lead to improvements in muscle control and reduce the spasticity (stiffness and involuntary movement) in the arm. FES can also be very effective at reducing the pain associated with subluxed shoulder.

Treatments for the shoulder, hand and arm use a Microstim 2v2 stimulator. The device is used daily at home to train the muscles.

What are the possible disadvantages and risks of FES?

There are no known serious side effects from using FES and most people find it comfortable to use. Rarely, some people may experience minor skin irritation which can usually be easily resolved.

Is FES to assist walking funded by the NHS?

FES is a NICE recommended treatment and is funded in many, but not all, parts of the UK. Treatment can also be privately funded.
Please contact OML for information about your area or request our funding information sheet.

How do I access treatment?

A referral is required from a GP or healthcare professional.
Self-referrals can be made for self-funded treatment.

Inclusion criteria summary for walking

- Dropped foot or other muscle weakness in walking due to a stroke
- Able to walk at least 5 metres with appropriate assistive devices (sticks, splints, etc). There is no upper limit to walking range
- Able to obtain standing from sitting without assistance from another person

Exclusion criteria summary for walking

- Dropped foot or muscle weakness due to peripheral nerve damage
- Epilepsy not controlled by medication
- Pregnancy or planned pregnancy
- Cancer in the area of the body that is being stimulated

Inclusion criteria summary for shoulder, hand and arm

- Reduced or absent movement in the shoulder, hand and arm

Exclusion criteria summary for shoulder, hand and arm

- Muscle weakness due to peripheral nerve damage
- Epilepsy not controlled by medication
- Pregnancy or planned pregnancy
- Cancer in the area of the body that is being stimulated
- Pacemaker or other active implanted device

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