

Moving more easily with a Mollii suit – Calli Pellegrini and Orsi Farkas

The Mollii suit is an assistive device that helps improve movement and muscle control in people with spasticity, movement disorders or abnormal muscle tone.

Designed at the Royal Institute of Technology in Stockholm, it is suitable for children, young people and adults with neurological conditions such as cerebral palsy, multiple sclerosis, stroke and traumatic brain injury. It can improve the speed, accuracy and fluidity of voluntary movement. In a nutshell, it can help a person move more naturally and with less effort.

When someone suffers brain damage, the way their brain communicates with parts of the body may be partially or completely interrupted. At a simplistic level, muscles work in pairs – as one contracts, its partner will automatically relax to allow this to happen. For example, when you lift a bag, the biceps contracts and the triceps relaxes in response, and when you put the bag down again, the roles are reversed with the triceps in the active role. If the appropriate signals are not getting through, the biceps may become spastic (tight all the time).

The Mollii suit can help activate parts of the body that are inactive or help reduce involuntary movements such as spasms.

It comprises a jacket and trousers that contain 58 strategically placed electrodes connected by silver threads. It comes with a control unit that is individually programmed to the specific needs of each user, and which can be easily updated when required.

Each electrode sends electrical impulses to the central nervous system at the rate of 20Hz, which the brain can recognise when it is awake. The signal is undetectable to the user, although a few occasionally feel a tingling sensation. Mollii does not directly stimulate the muscles like a TENS machine; it simply sends a signal that the brain can register, allowing it to communicate with the part of the body it was failing to reach before and start working reflexively with it.

Mollii is designed for home use. When people first get their suit, we recommend they wear it for an hour a day for the first three weeks, reducing this to an hour every other day once the brain has become



Savannah works with two therapists to improve her coordination

attuned. This is because the suit is only opening up communication channels and not repairing brain damage. The signal is like a song that sticks in your head: once Mollii sends a signal that the brain can hear, the 'song' sticks for a while and then fades. Donning the suit again re-establishes the signal.

With regular use, the wearer can increase their range of movements and do so with more comfort. For example, by improving their muscle tone, the suit can help them gain more control over actions such as sitting, reaching, standing or walking.

As children with cerebral palsy experience more movements, they learn what it feels like to move their bodies more naturally. This learning

stays with them even if the connection, brought about by Mollii, needs to be reawakened every 48 hours to help with the ease of movement. So, for example, if a child has not yet learned to walk and Mollii has eased their spasticity, they can access that part of their body and learn the required movements faster. A person recovering from a stroke has already experienced these movements and is not therefore starting from scratch; the suit simply improves their ability to relearn things they were able to do in the past.

The suit is easy to look after and can be washed on a gentle cycle. Children and young people are likely to need a new suit every year as they grow. There is a replacement scheme for children to help make this more affordable for families.

The level of support children get from the NHS can vary and some children find themselves on a long waiting list just to get a diagnosis, let alone any support. An appointment in a private practice with a Mollii assessor will typically take about 90 minutes and cost around £100. The UK charity CPotential offers free assessments, which last a little longer to allow the family to discuss all the child's needs in detail. The charity also offers a free speech and language clinic with its specialist speech and language therapist, which parents can attend at the same time as they come in for the Mollii assessment.

Like many assistive devices, Mollii is not cheap and the decision to invest in one should be considered carefully. To help with this, CPotential videos the assessments and gives parents a copy to play at home and show to other professionals supporting the child, so that they can make an informed decision. For parents with limited means, the assessment video can later help them fundraise for a suit.

Mollii is not suitable for everyone. By offering parents a free assessment for their children, CPotential offers a risk-free opportunity to try it out.

Outcomes are very individual. The major differences we see include improved posture, better control of movement,



Savannah's Mollii suit is made from light, stretchy material similar to a swimsuit

better range of movement overall, improved gross and fine motor skills, and better coordination, all for less effort. This means that the user can do more, more easily, and is generally less tired. As their coordination improves, they grow in confidence and achieve more within their peer group while being better able to access the curriculum. For example, their writing skills may improve thanks to better control of fine motor skills.

Mollii users time their use of the suit to fit in with family routines as well as their own needs. For example, some children wear the suit at school; others will wear it in the early evening before bed, helping them (and their parents) get a better night's sleep.

Inventions, the Swedish company

that developed Mollii in 2009, introduced it to the European market in 2012 after winning support on the Swedish version of *Dragons' Den*. Mollii suits have been available in the UK since 2015. They can work amazingly well and lead to life-changing impacts, which may seem trivial to the outside world, such as being able to play with a sibling, but which are massive to the family.

CPotential is based in London and offers Mollii assessments to customers in London and the surrounding counties. To book an assessment, email mollii@cplondon.org.uk or visit <http://cpotential.org.uk/services/mollii>

For Mollii assessors in other parts of the UK, contact the UK distributor, Remotion Ltd. A Mollii suit costs £4,100, which includes rechargeable batteries and a charger. Replacement suits for growing children, if bought within 12 months of the previous suit, are £960.

www.remotion.co.uk



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