

CONNECTIONS

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Spinal Cord Stimulation

Understanding how the spinal cord acts as a nerve superhighway, transmitting electrical signals.

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ARC-EX Therapy

Breakthrough techniques to restore damaged nerve function using non-invasive electrical stimulation.

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Understanding tSCS, Request a Spinal Research T-Shirt,
Your Perfect Fundraiser, Meet the Team, Leaving a Lasting Legacy.

Dear all,

Welcome to our autumn edition of Connections. In this issue, we're shining a spotlight on the groundbreaking world of spinal stimulation research. It's a field that holds immense promise for those living with spinal cord injuries, and we're proud to be at the forefront of this vital work. We'll take you inside some of the laboratories we are funding and introduce you to the brilliant minds who are dedicated to finding new ways to repair damaged spinal cords and restore function. Their stories are truly inspiring, and I know you'll be as excited as I am about the potential breakthroughs on the horizon.

But research is just one part of the story. This newsletter is also a celebration of you – our incredible supporters. We'll be showcasing some of the amazing fundraising efforts that have taken place over the past six months. Your dedication and generosity are what fuel our work and make progress possible.

So, grab a cup of tea, settle in, and enjoy this glimpse into the world of Spinal Research. Thank you for your unwavering support. Together, we are making a difference.



Kind regards,

Louisa McGinn
CEO, Spinal Research



Transcutaneous Spinal Cord Stimulation (tSCS)

Let's picture your spinal cord as a superhighway of nerves, bustling with messages zipping between your brain and the rest of your body. When this superhighway gets damaged, those crucial messages are interrupted and this may impair movement of the body.

How Does tSCS Work?

Instead of resorting to surgical procedures to address specific spinal cord injuries, we are looking at a non-invasive option and that is where tSCS comes in. Transcutaneous literally means "through the skin"! A special device sends small electrical signals through your skin to your spinal cord. These electrical signals send a small jolt to the nerves to revive them.

Why Is tSCS so Amazing?

1. Non-invasive.
2. Improvement in mobility.
3. Potentially reduces (chronic) pain.

Real-Life Magic

Early findings suggest that tSCS can effectively reduce spasticity, potentially leading to significant improvements in walking ability. This breakthrough could be a game-changer for those seeking to regain mobility and independence.

How is it Done?

1. **Electrode Placement:** Electrode pads are applied to the skin over your spinal cord.
2. **Electrical Pulses:** The device transmits mild electrical pulses through the pads.
3. **Sensation:** You may experience a tingling feeling.
4. **Therapeutic Movements:** You may be asked to perform certain movements while the device is active, assisting in the retraining of your body.

The Science Behind the Scenes

Our nerves communicate using tiny electrical signals. TSCS enhances or stimulates these signals, helping damaged nerves to potentially regain their function.

Future Possibilities

Scientists and clinicians are excited about tSCS because it shows hope for helping many people with spinal cord injuries. By supporting and encouraging research, our understanding of the effect tSCS has on the nervous system would deepen and this may pave the way to potential new therapeutic approaches and improved clinical outcome.

In a Nutshell

TSCS is a cutting-edge, non-invasive therapy that employs electrical pulses to assist individuals with spinal cord injuries in improving movement. It enhances the body's nerve system, paving the way for new opportunities in recovery and pain relief.

Disclaimer: All ONWARD Medical therapies are investigational and not available for commercial use.

ARC-EX Therapy: A Breakthrough for SCIs

Non-invasive electrical stimulation over the cervical spinal cord has shown improvements in arm and hand functions in people with chronic cervical spinal cord injury (SCI).

The Challenge of Spinal Cord Injury

Spinal cord injury disrupts the transmission of signals between the brain and spinal cord. These signals are involved in controlling motor and sensory function. An injury that is at a higher level (closer to the top of the spine) is associated with a more extensive impact on neurological function. For individuals with a cervical injury, restoring hand and arm function is consistently ranked as a top priority for improving quality of life.

What They Set Out To Achieve

The Up-LIFT study aimed to assess the safety and effectiveness of ARC-EX therapy in restoring hand and arm function in people with spinal cord injury.

What is the ARC EX device?

Spinal cord stimulation can be achieved by delivering an electrical current through electrodes placed on the skin's surface. This can be performed with ONWARD's ARC-EX device.

The device includes electrodes which are placed above and below the site of injury. These electrodes are connected to a stimulator device which can deliver a very precise level of electrical current. This is controlled by a tablet-based computer.

How They Did It:

The Research Process

Over the course of a year, sixty-five participants were recruited in the Up-LIFT trial across fourteen SCI centres in the US, Europe, and Canada. Participants ranged in age from 22 to 75 years and had a chronic cervical spinal cord injury classified as either AIS grade B, C, or D.

Following initial baseline assessments, participants engaged in an intensive rehabilitation program for 2 months. This was described as the wash-in (control) period. After this period, participants continued the rehabilitation program for two additional months, this time with the addition of ARC-EX therapy. This was described as the test period.

Participants were assessed across two core domains: strength and function in the hands and arms. These were performed using a set of well-established outcome measures.

Improvements in function and strength following the rehabilitation only period were compared to performance during the test period, which included a combination of rehabilitation and ARC-EX therapy.

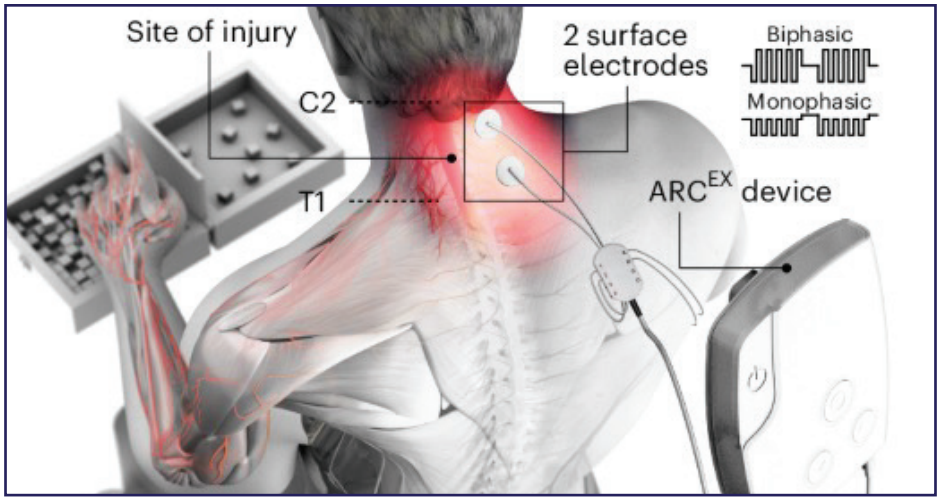


Illustration of a participant connected to the ARCEX device, with stimulating electrodes placed above and below the injury site.

Key Findings: What Did They Learn?

- **Safety:** No serious adverse events were reported in relation to ARC-EX therapy.
- **Gains in strength and function:** Upon completion of ARC-EX therapy, seventy two percent of participants met or exceeded the responder criteria for improvement in at least one measure of strength, and one measure of functional performance.
- **Ninety percent of participants** met the responder criteria for improvement in either strength or functional performance.
- **Improvements in sensory function:** ARC-EX Therapy also improved the recovery of sensory function.
- **Lasting change:** Neurological improvements have been reported to last for at least 3–6 months after ARC-EX therapy, even after treatment has been stopped.
- **Increases in overall well-being:** Participants also reported a decrease in the frequency and severity of muscle spasms, improved sleep quality and reduced pain.

What's Next: Future Directions

Future investigations will be required to better understand the mechanisms of arm and hand functions in response to ARC-EX therapy. These studies will support the optimization of ARC-EX Therapy and will guide the design of future trials which may seek to improve additional functions in people living with SCI.

Learn more about our research projects here.



Scan the QR code or visit spinal-research.org/home/our-research

The numbers

EVERY
2

hours someone is **paralysed** by a spinal cord injury in the UK



4,400

new injuries occur every year in the UK



105,000

people currently living with a SCI in the UK



12

SCI injuries occur every day in the UK

people estimated to live with a SCI globally (WHO)

15.4 million



We exist to cure **paralysis**



50+

phD studentships funded. Many of these specialists are now running world-class research labs



3-5

years until some of our projects become real life treatments



2.2

million pounds invested in research over the last few years

Meet the team

Cynthia Sam

Introducing Cynthia Sam, our new Research Portfolio Manager who joined us in July 2024. Cynthia is originally from the Seychelles and currently lives in West Oxfordshire with her husband and two young daughters.



Can you tell us a little bit about your background?

I have always been passionate about science and research. After completing a PhD in Cardiovascular pharmacology and physiology, I did a few years of postdoctoral research in Oxford and then transitioned to working in charitable organisations. Most recently, I managed a portfolio of science research projects based in Africa!

Can you tell us about your new role?

As the Research Portfolio Manager, my goal is to foster and strengthen our relationships with grantees while overseeing funding calls, applications, legal and financial aspects, and reporting. It's an exciting challenge that keeps me deeply engaged with the research community.

How are you settling in to your new role?

It's been a busy, wonderful first month! We have a lot of exciting projects going on and new ones starting. Recently, I had the honour of meeting our supporters, Jon and Lloyd who raised over £18K for Spinal Research! Additionally, I met some of our researchers at King's for a lab tour and to know more about the projects that we are funding!

How will this help our mission to cure paralysis?

I'm excited to manage our growing research portfolio, ensuring its smooth progression as we secure various funding sources. My role is vital also for showcasing progress in research to our fundraising team, by communicating complex scientific concepts in clear and accessible way. Keeping our fundraisers informed empowers them with knowledge they need to keep supporting our cutting-edge research and championing our cause.

Why not reach out and say hi?

If you like to find out more about Cynthia and her new role please email: info@spinal-research.org

What's your perfect fundraiser?

Discover the best way for you to support Spinal Research Charity. Answer a few questions about your hobbies and we'll suggest the perfect fundraiser for you!

1. How do you like to spend your free time?

- A) Staying active or visiting the gym.
- B) I'm happy keeping myself busy at home.
- C) Organising social events and being with friends.
- D) Travelling and exploring new places.



2. What describes your ideal weekend?

- A) Going to Parkrun on a Saturday.
- B) Trying out new recipes in the kitchen.
- C) Meeting up with friends or hosting a dinner party.
- D) Walking in nature.



3. How do you prefer to stay busy?

- A) Participating in sports or fitness activities.
- B) Cooking or baking in the kitchen.
- C) Attending or hosting events with friends and family.
- D) Travelling to different locations and experiencing new cultures.



Your Results:

- **Mostly A's: Running Enthusiast**
Join a charity run in your local area.
Gather sponsors and run for a cause!
- **Mostly B's: Baking Buff**
Host a bake sale.
Share your delicious creations and raise funds!
- **Mostly C's: Social Butterfly**
Organise a social event like a dinner party, card night, or charity auction.
Gather your friends for a fun time while supporting a great cause!
- **Mostly D's: Adventurer**
Join an overseas adventure like our Alpine Experience.
Get sponsored for your challenge and explore the world while raising funds!

Get Started Today!

Visit spinal-research.org/fundraise for more ideas and to get started, or email info@spinal-research.org

Show the world **you care!**

Want to show the world how important a cure for paralysis is to you? Every t-shirt worn spreads a message of hope and brings us closer to groundbreaking research discoveries. Request your Spinal Research t-shirt today!

1

Fundraise for Spinal Research

Sign up to fundraise, and we'll send you a t-shirt to wear at your event. Get social with a bake sale, dinner party, or cards night. Or get active with a personal challenge, mountain climb, or sports club event. Whatever you choose, we'll support your fundraiser every step of the way.

spinal-research.org/fundraise/yourway

2

Become a Spinal Research Ambassador

Spinal Research Ambassadors are a group of passionate supporters with one common goal – to help cure paralysis. They champion Spinal Research in their local area, and networks, and raise awareness and essential funds. Join the family and you will receive a welcome pack including a t-shirt.

spinal-research.org/ambassadors



Leaving a lasting legacy

Your gift, their future

Leaving a gift in your Will to Spinal Research is a powerful way to make a difference that extends far beyond your lifetime. Your generosity ensures that our vital work continues, bringing hope and healing to those affected by spinal cord injuries.

FAQs

Why is legacy giving important for Spinal Research?

Legacy gifts are crucial for our long-term sustainability. They fund groundbreaking research, provide essential services, and fuel our mission to create a world free from spinal cord injury.

How does Spinal Research use legacy gifts?

Your legacy gift could fund cutting-edge research projects and train the next generation of scientists. Every gift, no matter the size, has a real and lasting impact.

Is it complicated to leave a gift in my Will?

No, it's a simple process. You can include a specific amount, a percentage of your estate, or a particular asset. We recommend speaking with a solicitor to ensure your wishes are carried out correctly.

Will my gift make a difference?

Absolutely! Your legacy gift will be a beacon of hope, helping us to accelerate research, improve lives, and ultimately find a cure for spinal cord injury.

How can I find out more?

Visit our website and search legacy or contact us directly at info@spinal-research.org to learn more about leaving a lasting legacy.

Together, we can create a brighter future for everyone affected by spinal cord injury.

For more information visit spinal-research.org/home/donate.



Puzzle time



Just for fun, test your grey matter and see if you can solve these puzzles!

CROSSWORD

Word searches are easy, right? How quickly can you find all the words listed below within this grid?

- QUADRIPLÉGIA
- ALPINE
- SPASTICITY
- BAKETHROUGH
- FUNDRAISE
- TRIALS
- INJURY
- RESEARCH
- NEURONS
- SCIENTISTS

O	T	S	T	S	H	C	R	A	E	S	E	R	T
A	F	U	N	D	R	A	I	S	E	D	S	C	S
Y	I	U	U	T	T	U	I	N	I	R	U	E	E
H	I	B	T	Y	T	I	C	I	T	S	A	P	S
G	T	S	T	S	I	T	N	E	I	C	S	S	P
U	I	A	I	G	E	L	P	I	R	D	A	U	Q
O	R	R	B	R	T	R	I	A	L	S	I	H	T
R	A	C	Y	T	C	E	S	T	E	H	I	E	A
H	T	R	T	C	D	N	T	N	Y	R	L	R	T
T	N	S	I	R	O	I	S	E	P	C	R	S	L
E	S	N	P	R	S	S	P	A	L	P	I	N	E
K	I	E	U	I	R	I	T	G	E	S	S	N	T
A	S	E	I	U	Y	E	L	H	Y	R	I	R	P
B	N	Y	R	U	J	N	I	D	D	H	C	E	S

CRYPTOGRAM PUZZLE

Use the numbers to decipher the phrase below.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

20 13 2 6 4 11

19 1 2 1 17 25 9 6

18 14 11 8 18 10 8 2

Team Connor completes a Land's End to John O'Groats cycle to mark 10 years since Connor's accident.



**spinal
research**

Feel free to get in touch

If you have any queries or questions around anything in this newsletter, please don't hesitate to drop us a line. You can write a letter, email or pick up the phone. Our office and phone lines are open Monday to Friday 9am – 5pm.

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Curing paralysis together
spinal-research.org



Spinal Research is a registered charity in England and Wales (1151015), and in Scotland (SC050578).