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The CatWalk Cure Programme

Update September 2025

"We're now able to improve the motor function and restore sensation to rats."
Prof. Darren Svirskis, Director CatWalk Cure Programme

From the Chair

Welcome to this, the second Cure Programme update- the end of Year 1.

The Cure Programme research team continued to grow throughout the year and now includes 22 researchers and PhD students. Under Prof. Darren Svirskis's lead, they have also secured in excess of $1.6 million in additional funds, over and above CatWalk funding and they've doubled their testing capacity.

This is how we really gather momentum. Now, Darren and the team have added a fifth research stream to the Programme. Translational Neurobiology will assist in the preparation for clinical trials.

If we thought we were moving fast before, everything just got a whole lot faster! One thing we have established for certain is that the cure will be a combination of several treatments and therapies. The whole will be greater than the sum of the parts.

In the same way, your support combines with that of others to create a wave much greater than any individual donation. Thank you for your continued support.

Grant Sharman
Campaign Chair

Year 1 Achievements & Year 2 Plans

Using Electric Fields

- End of Year 1 Outcomes:
  - Successful pilot of built-in stimulator in no-injury rats.
  - New hydrogel coating for implant successfully reduced cell adhesion in vitro.
  - Collaboration with the Auckland Bioengineering Institute.
- Priorities for Year 2:
  - Follow-up pilot planned for October 2025.
  - Extended Electrical Field treatment regime – from 1 hr/day to 24 hr/day stimulation.
  - Re-explore low frequency stimulation 0.1Hz.
  - Test enriched housing's impact on rehabilitation.

Electrical biomarkers of recovery

Reading signals from the spinal cord to identify the severity and parameters of an injury.

- End of Year 1 Outcomes:
  - Identified neural signal components that correlate with hind limb movement.
  - Identified initial biomarkers of injury.
  - Preliminary AI-driven machine learning for biomarkers of recovery.
- Priorities for Year 2:
  - Expand the machine learning approach.
  - Proof of principle of penetrating electrodes.

Implant longevity:

- End of Year 1 Outcomes:
  - Electrode delamination prevented.
  - Identified failure mode.
- Priorities for Year 2:
  - Evaluate implant removal.
  - Implant and PCB assembly redesigns.
  - Stress test changes.
  - Reduce tissue encapsulation.

Pharmaceutical therapies

To deliver medications to the right place, in the right dosage, over the right timeframe.

- End of Year 1 Outcomes:
    - Successfully administered poloxamer gel formulation alongside the spinal cord for controlled drug release.
    - Explored microparticle formulation for sustained release of growth factor.
- Priorities for Year 2:
    - Test higher volumes gel placement and release over longer timeframes.
    - Establish a versatile drug delivery platform combining microparticles and gels.
    - Expand testing to include other drug molecules.

Ultrasound therapies

- End of Year 1 Outcomes:
    - Developed a robust setup to test ultrasound safety and effectiveness on nerve cells.
- Priorities for Year 2:
    - Explore ultrasound impact on regeneration of injured nerve cells.
    - Move testing to central nervous system cells.
    - Explore ultrasound and drug delivery.
    - Explore technology for animal models.

Cell-based therapies

- End of Year 1 Outcomes:
    - **Patent filed** in December for oligodendrocyte direct reprogramming protocols.
    - Reprogrammed oligodendrocytes remyelinating corpus collosum in rats. Exploring the application in spinal cord.
    - Testing alternate growth factors.
- Priorities for Year 2:
    - First proof of concept in vivo transplant study.

Translational neurobiology

- Three lines of research:
    - Visualising neuronal regeneration.
        - Funded by CatWalk Postdoctoral Fellowship.
    - Preclinical and clinical combinational trial (PENT)
        - Funded by Wings for Life.
        - In collaboration with NovaGo Therapeutics, Switzerland, and DZNE, Germany.
    - Canine veterinary clinical trial.
        - In collaboration with Hanover University of Veterinary Medicine.

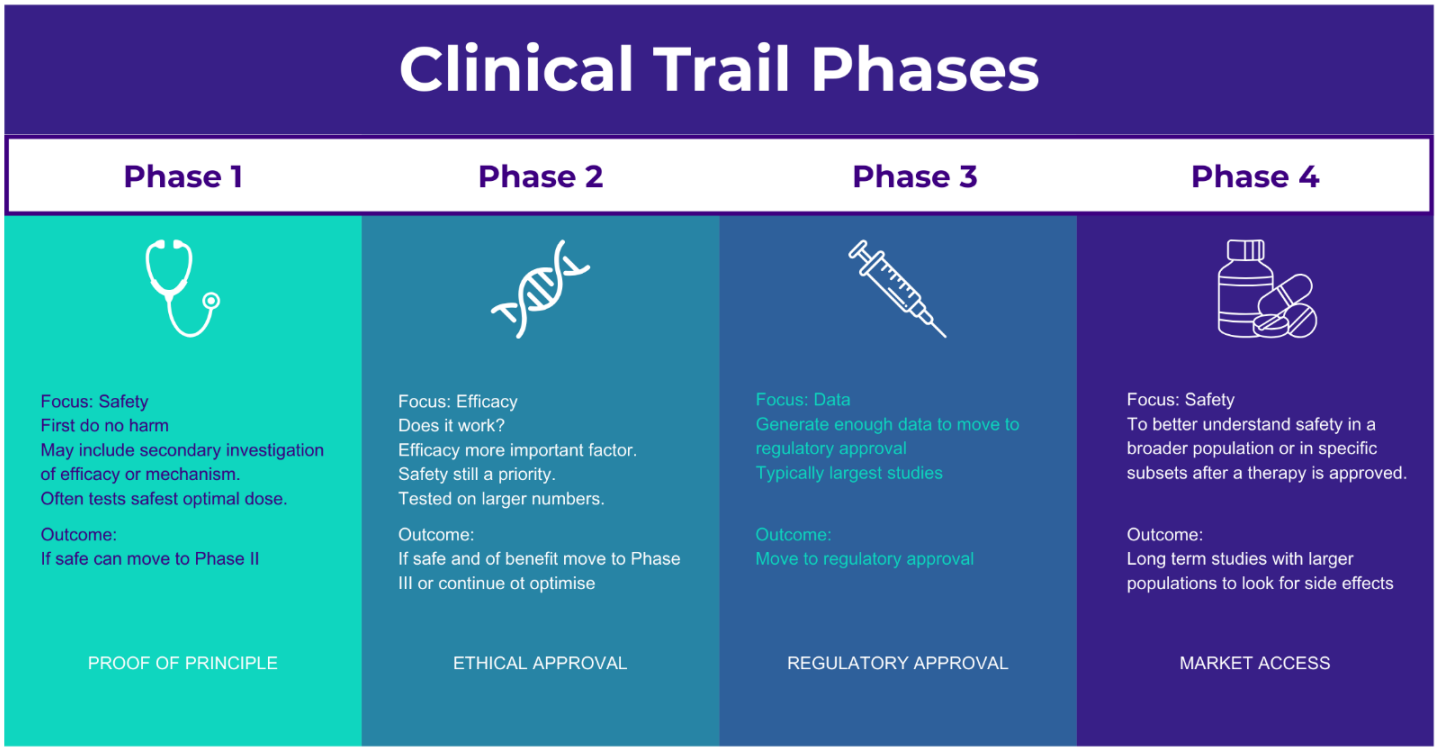
The Research Process

In the March Cure Programme Update, we shared the Cure Programme Research Strategy – a five-year timeline (also published in the FY25 Annual Impact Report). That timeline culminates in treatment options ready for clinical trial by 2029. But what happens then?

CatWalk's approach to research.

While CatWalk is dedicated to accelerating the speed of research and breaking down the barriers to finding a cure, we are also committed to thorough, rigorous, scientific best practice. We are steadfast that any treatment must, first and foremost, do no harm.

We're determined that proposed treatments need to be clinically proven to be safe, effective, translatable and accessible. CatWalk's goal is to heal the spinal cord and identify safe, effective treatments that are available to everyone.



Cure Programme Publications

Oct 24 – Aug 25

The publication of research in respected, peer-reviewed journals shares knowledge, fosters collaboration, and facilitates peer review to validate research quality, accuracy, and credibility

Detection of spinal action potentials with subdural electrodes in freely moving rodents

Journal: Scientific Reports
Published: 20 August 2025
Authors: Brittany Hazelgrove, Bruce Harland, Salvador Lopez, Maria Asplund, Leo K. Cheng, Darren Svirskis & Brad Raos

"This study is the first to validate the neural origin of recorded electrical activity from the spinal cord in freely behaving animals without the application of any external stimulus. Metrics identified and evaluated can inform the development of injury biomarkers and recovery tracking following spinal cord injury."

Accessing the Subdural Space of the Rodent Spinal Cord for Treatment Delivery

Journal: JoVE – Journal of Visualized Experiments – Neuroscience
Published: 8 August 2025
Authors: Salvador Lopez, Chien Kow, Manju Ganesh, Darren Svirskis & Bruce Harland

"This study presents a detailed protocol for delivering treatments directly to the spinal cord of rats. Examples of delivering electroceutical and pharmaceutical treatments are described. By openly sharing our methodologies, we contribute to advancing and standardising global research efforts."

Daily electric field treatment improves functional outcomes after thoracic contusion spinal cord injury in rats

Journal: Nature Communications
Published: 26 June 2025
Authors: Bruce Harland, Lukas Matter, Salvador Lopez, Barbara Fackelmeier, Brittany Hazelgrove, Svenja Meissner, Simon O'Carroll, Brad Raos, Maria Asplund & Darren Svirskis

"EF (Electric Field) treatment is one of the few therapies shown to regenerate axons tracts and improve functional outcomes after SCI, however, it has to date not been able to be administered safely and effectively due to the demands placed on metal electrodes by low-frequency stimulation and their epidural implantation. Here, we show how this is made possible using an ultrathin subdural implant with SIROF electrodes to administer a daily 2 Hz EF treatment in rats with a thoracic contusion injury.

…receiving the treatment showed significant improvement in recovery of hind limb function from week 4 onwards compared with non-treated controls and touch sensitivity significantly improved after one week of treatment and remained consistent throughout the study period."

Electrochemical impedance spectroscopy in vivo for neurotechnology and bioelectronics
Journal: Nature Reviews Electrical Engineering
Published: 03 January 2025
Authors: Brittany Hazelgrove, Lukas Matter, Brad Raos, Bruce Harland, Leo Cheng, Maria Asplund & Darren Svirskis

"Without a clear understanding of the experiment and experimental set-up, it is challenging to draw meaningful conclusions and for results to be extrapolated across studies to benefit and advance the field. This Review discusses in vivo EIS experiments, specifically focusing on challenges in the experimental set-up, the equipment used, data presentation and circuit modelling for neural interfaces. We propose guidelines for methodical reporting and a consistent, standardized use of terminology, paramount in understanding the performance of electrodes functioning at neural interfaces and promoting the transferability of findings across studies."

Safe subdural administration and retention of a neurotrophin-3-delivering hydrogel in a rat model of spinal cord injury
Journal: Scientific Reports
Published: 25 October 2024
Authors: Svenja Meissner, Salvador Lopez, Shaun Rees, Simon O'Carroll, David Barker, Bruce Harland, Brad Raos & Darren Svirskis

"…a novel approach to sustain the delivery of GFs and other molecules of interest directly to the cord through the intrathecal injection of a recently developed hyaluronic acid-modified heparin-poloxamer hydrogel that contains NT-328. This gel uses FDA-approved poloxamers and is designed to be injected into the intrathecal space immediately after contusion SCI into rats and to transition to a gel in situ, offering a less invasive treatment approach."

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CatWalk Operational Update

Annual Impact Report FY25

20 years!

20 years of fundraising. 20 years of identifying and nurturing budding researchers. 20 years of searching for and supporting vital research. 20 years have brought us to the verge of a cure. Now, with an internationally renowned team dedicated to spinal cord injury research, we are so close.

It's been a mammoth journey, and so it is with immense pride that I present this year's Annual Impact Report. In it, we reflect on the last 20 years and the amazing support that has brought us to this point. Years of faith and trust, of brave decisions, strategic thinking and the influence of wildly intelligent researchers and advisors.

Driving research is hard. It takes time. There are endless rules and regulations. There are hundreds of good ideas, multitudes of options, and so, so many barriers. But drawing from Catriona's indomitable example, we refuse to be deterred or sidetracked. We're here for one purpose and one purpose only- to cure spinal cord injury. Thanks to you, we will.

Lastly, we acknowledge that success, be it in life, research, or business, is built upon the efforts of those who came before us. Those who learnt the hard lessons built the foundations for future success. In every aspect of CatWalk- in our strategic choices, in our fundraising capability, in our research success- we stand on the shoulders of giants.

Your past support has led us here. Your continued support will elevate those who follow.

Thank you

Meg Speirs
Executive Director

P.S. You can read the Annual Impact Report FY25 online or download it as a PDF here.