

**BIOGRAPHICAL SKETCH**

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NAME: Burkhart, Ian

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: President, North American Spinal Cord Injury Consortium

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
Columbus State Community College, Columbus, OH	AAS	05/2016	Business Management
Ohio State University, Columbus, OH	BA	05/2020	Family Financial Management

**A. Personal Statement**

I sustained a C5 spinal cord injury during a diving accident in 2010 that caused tetraplegia. This severe disability enabled a strong drive to seek positive energy, focus on the good aspects of life and people, and utilize all available resources to improve quality of life for self and others. I am the ideal person to serve on the proposed project given my personal experiences with tetraplegia, my participation in a clinical trial involving functional electrical stimulation, and my work in three spinal cord injury advocacy groups.

As the President of the North American Spinal Cord Injury Consortium (NASCI), I have the honor to lead a collaborative organization working with the many non-profit and service organizations that directly represent and serve those living with spinal cord injury across North America.

Spinal cord injury is a life changing condition leaving people with various forms of paralysis, autonomic dysfunction, and an array of secondary health conditions. At the moment, there are very few treatments for SCI to help people living with the condition and there is no cure. As one of the founding members of the NASCI and the current President, I have a close affiliation of the leaders throughout our community. As a person living with tetraplegia due to a SCI for over 13 years, I live the experience as well. Our advocacy organization has a reach of over 700,000 people living with SCI, caregivers and family members across North America making this a unique organization to reach an isolated population.

I am the founder and president of the Ian Burkhart Foundation which aims to restore lives and provide hope to individuals with spinal cord injuries. The foundation raises funds to support advocacy work, scientific research, and financial grants made to individuals with spinal cord injury. The foundation also serves as a consulting platform where I have assisted in medical device development and strategy, end-user perspective acquisition and dissemination, and clinical trial design.

I am the president of the NASCI which has the mission to bring about unified achievements in research, care, cure, and policy by supporting collaborative efforts across the spinal cord injury community. Previously served as the vice president and chair of the project review committee. As president I manage ongoing collaborations as well as our fee for service lived experience engagement for industry partners. NASCI's current advocacy efforts focus on research and the inclusion of people living with spinal injury as partners throughout the research process.

I am a member of Unite 2 Fight Paralysis (U2FP). U2FP unites and empowers the international spinal cord injury community to cure paralysis through advocacy, education, and support for research. U2FP's efforts involve working with state-level lawmakers to draft legislation to fund SCI research and require SCI consumers to be involved in all funded projects to ensure translation to maximize impact. This created funding for the Ohio Third Frontier Research Initiative for Spinal Cord Injury allocating \$1.5 million biennially, which I sit on the review committee for.

## B. Positions and Honors

### Positions and Employment

2018 – Present	President, North American Spinal Cord Injury Consortium
2017 – Present	President, Ian Burkhart Foundation, Columbus, OH
2022 – Present	Founder, Brain Computer Interface Pioneers Coalition

### Other Experience and Professional Memberships

2023 – Present	Committee Member, FDA Patient Engagement Advisory Committee
2018 – Present	Reviewer, Ohio Department of Higher Education, Third Frontier Incentive
2018 – Present	Project Review Committee, North American Spinal Cord Injury Consortium
2016 – Present	Member, Unite 2 Fight Paralysis
2016 – Present	Peer Mentor, Christopher & Dana Reeve Foundation

### Honors

2022	Hall of Fame – Dublin Jerome High School
2021	Distinguished Alumni Award - Dublin City Schools
2019	Pioneer Award – Rockefeller Neuroscience Institute
2017	Brain Health Hero Award – Stan & Jodi Ross Center for Brain Health Performance
2012	Coach of the Year – Midwest Scholastic Lacrosse Coaches Association

## C. Contribution to Science

1. I was the sole participant in a clinical trial entitled “Reanimation in Tetraplegia” which was conducted by The Ohio State University Wexner Medical Center and the Battelle Memorial Institute. I received a surgically-implanted microelectrode array that records activity from my motor cortex, uses a machine learning algorithm to decode cortical activity, and then applies functional electrical stimulation to allow me to control my wrist and hand movements. This system was the first system to use intracortical signals to control muscle stimulation in a paralyzed human. I worked on this project for 8 years, therefore I have intimate knowledge of the challenges, pitfalls, and successes in using an advanced technology to restore movement in my paralyzed arm.
  - a. Bouton CE, Shaikhouni A, Annetta NV, Bockbrader MA, FriedenberG DA, Nielson DM, Sharma G, Sederberg PB, Glenn BC, Mysiw WJ, Morgan AG, Rezai AR. Restoring cortical control of functional movement in a human with quadriplegia. *Nature*. 2016 May 12;533(7602):247-250. PubMed PMID: [27074513](https://pubmed.ncbi.nlm.nih.gov/27074513/).
  - b. C. Dunlap, L Bird, **I Burkhart**, K Eipel, S Colachis IV, N Annetta, P Ganzer, G Sharma, D FriedenberG, R Franklin, A Hassani, F Solzbacher, M Bockbrader. "Towards a Modular Brain-Machine Interface for Intelligent Vehicle Systems Control – A CARLA Demonstration," 2019 IEEE International Conference on Systems, Man and Cybernetics (SMC), 2019, pp. 277-284, doi: 10.1109/SMC.2019.8914317. <https://ieeexplore.ieee.org/document/8914317>
  - c. Bockbrader M, Annetta N, FriedenberG D, Schwemmer M, Skomrock N, Colachis S 4<sup>th</sup>, Zhang M, Bouton C, Rezai A, Sharma G, Mysiw W. Clinically significant gains in skillful grasp coordination by an individual with tetraplegia using an implanted brain-computer interface with forearm transcutaneous muscle stimulation. *Arch Phys Med Rehabil*. 2019 Mar 20. Pii S0003-9993(19)30163-7. PubMed PMID: [30902630](https://pubmed.ncbi.nlm.nih.gov/30902630/).
  - d. Annetta NV, Friend J, Schimmoeller A, Buck VS, FriedenberG DA, Bouton CE, Bockbrader MA, Ganzer PD, Colachis Iv SC, Zhang M, Mysiw WJ, Rezai AR, Sharma G. A high definition noninvasive neuromuscular electrical stimulation system for cortical control of combinatorial rotary hand movements in a human with tetraplegia. *IEEE Trans Biomed Eng*. 2019 Apr;66(4):910-919. PubMed PMID: [31006673](https://pubmed.ncbi.nlm.nih.gov/31006673/).
  - e. FriedenberG DA, Schwemmer MA, Landgraf AJ, Annetta NV, Bockbrader MA, Bouton CE, Zhang M, Rezai AR, Mysiw WJ, Bresler HS, Sharma G. Neuroprosthetic-enabled control of graded arm muscle contraction in a paralyzed human. *Sci Rep*. 2017 Aug 21;7(1):8386. PubMed PMID: [28827605](https://pubmed.ncbi.nlm.nih.gov/28827605/).

2. Assisted in survey design and development for Consumer Engagement in Practice: Results from a Spinal Cord Stimulation Survey. Spinal cord stimulation has shown potential for functional improvement for people living with spinal cord injury (SCI). However, the perspectives of those living with SCI have rarely been obtained on this topic. The purpose of this research survey was to obtain input from people with lived experience of SCI about their perspectives and opinions on spinal cord stimulation. The survey was developed using an integrated knowledge translation approach through a project partnership between the Praxis Spinal Cord Institute (Praxis) and the North American Spinal Cord Injury Consortium (NASCI). The content of this survey was developed by an advisory team with diverse experience in advocacy work, research, participation in clinical trials and a strong connection to their local communities. Survey development was strengthened with integrated knowledge translation. Novel questions, options for answers and messaging were developed based on input from the advisory committee. The result was a survey with questions that will assess priorities, meaningful benefits, and expectations for recovery with spinal cord stimulation therapy. The survey also collected opinions on clinical trial design, level of risk, willingness to pay and overall demand.
  - a. Nancy P. Thorogood, Z Waheed, J Chernesky, **I Burkhart**, J Smith, S Sweeney, R Wudlick, S Douglas, D Wang, V Noonan; Spinal Cord Injury Community Personal Opinions and Perspectives on Spinal Cord Stimulation. *Top Spinal Cord Inj Rehabil* 1 March 2023; 29 (2): 1–11. <https://doi.org/10.46292/sci22-00057>
3. Assisted in development of ‘Controlling Functional Reaching with Eye and Head Movements of People with High Cervical Spinal Cord Injuries’ at Cleveland State University. The overall objective of this pilot project is to develop methods that allow people with high tetraplegia to control components of helper robot reaching movements using our existing eye and head tracking system. This system combines developing a method for identifying and locating objects in a 3-D space via eye and head orientation tracking, identifying a feasible strategy allowing a person to control free movement of the robot once an object is acquired, and identifying a feasible strategy for controlling robot movements close to the head. This approach enables independent control over various activities of daily living (ADLs). This project is currently ongoing and is funded by Ohio department of higher education third frontier research initiative spinal cord injury.
  - a. J. R. Schultz, A. B. Slifkin, H. Yu and E. M. Schearer, "Proof-of-Concept: A Hands-Free Interface for Robot-Assisted Self-Feeding," 2022 International Conference on Rehabilitation Robotics (ICORR), Rotterdam, Netherlands, 2022, pp. 1-6, doi: 10.1109/ICORR55369.2022.9896535.
  - b. Schultz JR, Slifkin AB, Schearer EM. Controlling an effector with eye movements: The effect of entangled sensory and motor responsibilities. *PLoS One*. 2022 Feb 3;17(2):e0263440. doi: 10.1371/journal.pone.0263440. PMID: 35113943.
4. Community engagement is an important method of knowledge translation in spinal cord injury (SCI) research where researchers collaborate with people with lived experience, care partners, and other research users to improve the quality of research. The advisory committee made usable recommendations for enhancing recruitment methods and reducing burden and barriers to participation. The successful partnership between NASCI and JCRS shows the feasibility and value of SCI community engagement in research.
  - a. Biller, O.M., Biundo, J., Mitchell, E.SL., Richardson, B., **Burkhart, I.**, Kim, R., Gerhardt, N., Mulcahey, MJ. “Promoting community engagement in spinal cord injury research: a case example”. *Spinal Cord* (2023). <https://doi.org/10.1038/s41393-023-00926-x>