

MAN USES OWN BRAINWAVES TO RETRAIN PARALYZED HAND



Computer chip in brain works with software, gives man functional control of his hand

The Ohio State University Wexner Medical Center / Battelle

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SUGGESTED TEASE	STILL TO COME THE REMARKABLE STORY OF A MAN WHO USED CUTTING-EDGE TECHNOLOGY AND HIS OWN BRAINWAVES TO PERFORM FUNCTIONAL MOVEMENTS WITH HIS PARALYZED HAND. DETAILS NEXT IN HEALTH NEWS.
ANCHOR LEAD	AFTER BECOMING THE FIRST PATIENT EVER TO MOVE A PARALYZED HAND BY USING HIS OWN THOUGHTS, AN OHIO MAN IS MAKING HEADLINES AGAIN. A NEW STUDY IN THE JOURNAL NATURE IS OUT, DETAILING THE REMARKABLE RESULTS OF A YEAR-LONG EXPERIMENT. DOCTORS SAY BY USING HIS OWN BRAINWAVES, NOT ONLY WAS THE MAN ABLE TO MOVE HIS HAND ONCE, BUT THE MORE HE TRAINED WITH A SPECIAL SLEEVE AND COMPUTER PROGRAM, THE BETTER HE GOT. WITH MORE ON HIS INCREDIBLE PROGRESS, HERE'S CLARK POWELL.
	(Nats - Playing guitar hero) :02
CG: Courtesy: The Ohio State University Wexner Medical Center Shots of Ian playing video game Still photos from hospital	IT'S NOT UNUSUAL FOR A COLLEGE AGE STUDENT TO SPEND HOURS PLAYING A GUITAR VIDEO GAME - BUT THE FACT THAT IAN BURKHART IS DOING IT IS NOTHING SHORT OF INCREDIBLE. PARALYZED FROM THE NECK DOWN IN A DIVING ACCIDENT IN 2010, IAN COULDN'T MOVE A FINGER. :14
CG: Ian Burkhart Paralyzed from shoulders down	"And now, it's just something that's so fluid it's just kind of like it was before I had my injury, where I just think about what I want to do and now I can do it." : 09
CG: June 2014	(Nats - Room applauds as Ian moves hand for the first time) :01
Wide shot of group applauding Close up of picking up spoon Shot of game dice stirring credit card	IAN MADE INTERNATIONAL HEADLINES IN 2014 - BECOMING THE FIRST PARALYZED PATIENT TO MOVE HIS HAND USING HIS OWN THOUGHTS. THAT DAY, HE SIMPLY PICKED UP A SPOON. TODAY, HE'S NOT ONLY PLAYING VIDEO GAMES, BUT POURING OBJECTS FROM A CUP, AND SWIPING CREDIT CARDS. ALL WITH THE AID OF THIS SLEEVE, A COMPUTER CHIP AND A MOVEMENT

Shot of Ian's face	ALGORITHM DEVELOPED BY BATTELLE THAT IAN CONTROLS WITH HIS BRAIN. :24
CG: Dr. Ali Rezai Ohio State University Wexner Medical Center	"Several years after a spinal cord injury his level of function has improved significantly so that he is able to have more use of his fingers and hands to do functional tasks. Which has not been demonstrated before." :12
Shots of surgery Shots of team hooking Ian up to wires Shot of sleeve Shot of Ian arriving at OSU Shots of Ian in therapy Close up of Ian / computer screen Close up of Ian moving hand	IN 2014 NEUROSURGEON ALI REZAI (<i>pronounced: ALLEY ruh-ZEYE</i>) IMPLANTED THE COMPUTER CHIP IN IAN'S BRAIN AT THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER. THAT CHIP IS CONNECTED TO WIRES THAT COME FROM IAN'S HEAD AND ARE HOOKED TO THIS SLEEVE TO CREATE A NEURAL BYPASS. FOR MORE THAN A YEAR IAN HAS MADE DOZENS OF TRIPS BACK TO OHIO STATE FOR THERAPY WITH A TEAM OF PHYSICIANS AND BATTELLE ENGINEERS . EACH TIME, COMPUTERS READ HIS THOUGHTS, DECODE THEM, AND SEND MESSAGES TO THE SLEEVE TO MOVE HIS MUSCLES. THE RESULTS OF IAN'S REMARKABLE PROGRESS ARE DETAILED IN A NEW STUDY IN THE JOURNAL NATURE. AND THOUGH IT MAY SOUND LIKE SCIENCE FICTION, THE MORE IAN AND THE COMPUTER WORK TOGETHER, THE MORE THEY LEARN TO LISTEN TO EACH OTHER ¹ - TAKING EVEN RESEARCHERS BY SURPRISE. :42
Nick Annetta, MS Battelle	"This is possible, you can take someone, a human being who is paralyzed and give them the ability to use that paralyzed limb again in a functional way." :10
Close up of device	RESEARCHERS HOPE THIS TECHNOLOGY CAN BE USED TO HELP A RANGE OF PATIENTS IN THE FUTURE, INCLUDING STROKE VICTIMS. :05
Chad Bouton, MS Former Battelle Engineer	"It is often very difficult for patients to regain movement in the hand and arm area, so this technology will help speed that recovery and make that rehabilitation much more effective." :13
Shots of Ian at unveiling	AND IAN IS OPTIMISTIC HIS EFFORTS WILL LEAD TO MEDICAL ADVANCES THAT CHANGE LIVES FOREVER. :05
Cover with video	"I have a lot more hope for the future now." :01
Ian (CG'd earlier)	"I always knew maybe someday something would happen, but now I know for sure that something // actually <u>is</u> happening." :09
Shots of Ian in therapy	AT OHIO STATE'S WEXNER MEDICAL CENTER, THIS IS CLARK POWELL REPORTING. :03
ANCHOR TAG	RESEARCHERS HAVE IDENTIFIED TWO MORE PATIENTS TO PARTICIPATE IN THE STUDY. EVENTUALLY, THEY HOPE TO DEVELOP WIRELESS TECHNOLOGY THAT COULD BE PAIRED WITH SLEEVES AND OTHER DEVICES TO HELP PARALYZED PATIENTS MOVE AGAIN.

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 Suggested post:	A year-long study has allowed a man to retrain his paralyzed hand using his own brain waves and a specialized sleeve. The study, which appears in the journal Nature , chronicles Ian Burkhart's progress at The Ohio State University Wexner Medical Center . See how it works and the advances Ian was able to make using this ground-breaking device.
References -	¹ <i>Restoring Cortical Control of Functional Movement in a Human with Quadriplegia</i> , Nature , April 2016. Online: http://nature.com/articles/doi:10.1038/nature17435
	Extra Bites
CG: Dr. Ali Rezai Ohio State University Wexner Medical Center	<p><i>Dr. Rezai talks about the goal of the study -</i> “Our goal is to use this technology so that these patients, like Ian, can be more in charge of their lives and can be more independent.”</p> <p><i>Dr. Rezai talks about Ian’s progress and what it means -</i> “We're thrilled that Ian has progressed significantly with this technology over the past year. This really provides hope, we believe, for many patients in the future as this technology evolves and matures, to help people who have disabilities from a spinal cord injury, or a traumatic brain injury, or stroke, to allow them to be more functional and more independent.”</p> <p><i>Dr. Rezai talks about the next phase of this technology -</i> “We're hoping that this technology will evolve and maybe a few years from now we can have a wireless system that allows a patient like Ian to be able to move his hand and his arm - functions of his arms and legs and overall function - much better without having cables to connect.”</p> <p><i>Dr. Rezai talks about the potential for smart phone applications -</i> “As this becomes more streamlined, hopefully over time, maybe integrate it into your cell phone and your cell phone that's universal now will be communicating with your sleeve to be able to have individuals be functioning more. One of the major goals for us is to make this be easily available, readily available and to be used by the patients at home.”</p>
CG: Nick Annetta, MS Battelle	<p><i>Annetta explains how the neural bypass system works -</i> “What our device does is it takes data directly from the brain, in this case Ian's brain, by an array that's implanted in his brain. It decodes that and takes those signals and uses them to simulate Ian's own forearm to cause his muscles to contract and move in the way that he wants them to.”</p> <p><i>Annetta explains how the system works -</i> “So it creates what we call a neuro bypass from the brain over the injured part of the spinal cord and back down to the forearm bridging over that injury and actually reanimating his paralyzed limb.”</p>

	<p><i>Annetta explains how Ian and the computer communicate -</i> “This is a technique called machine learning, where we take all this data from him while he’s thinking about doing a task, and we know what he’s thinking about and we use that as training data. Then we build a decoder around that.”</p> <p><i>Annetta talks about the future of this technology -</i> “Now, we by no means cured paralysis, but this is a proof of concept to show that you can do this. And that was the real message we wanted to get across.”</p> <p><i>Annetta talks about Ian’s dedication to the study -</i> “You could not ask for a better study participant. His drive is relentless. He’s not just willing to do what we ask of him, he’s presenting ideas to us that push us further. It’s been amazing.”</p>
<p>CG: Chad Bouton, PhD Former Battelle Engineer</p>	<p><i>Bouton talks about the impact of this technology -</i> “This will allow the millions of patients around the world who are living with paralysis get back to a level of independence that they had before the injury.”</p>
<p>Ian Burkhart Paralyzed from shoulders down</p>	<p><i>Ian talks about the progress he’s made -</i> “When we first hooked everything up, you know for the first time of being able to move my hand, it was a big shock, because you know it’s something that I hadn’t moved in about 3 and a half years at that point. Now, it’s more of something where I expect it to move.”</p> <p><i>Ian talks about the future with this technology -</i> “When we first started the research, it was really just a proof of concept story, and now that we’ve been able to really see that it’s something that can work. I know that in the future it’ll really be able to help a lot of people.”</p> <p><i>Ian talks about how he would like to use the technology -</i> “The biggest dream would be to get full function of my hand back, both my hands. You know, because then that allows you to be a lot more independent and not have to rely on people for kind of simple day-to-day tasks that you take for granted.”</p> <p><i>Ian talks about the importance of hope -</i> “Hope is really important, and for me it’s really just hope for the future, that things will get better. I think if anyone can do anything to make things better in the future, they should go for it.”</p>
<p>CG: Dr. W. Jerry Mysiw Ohio State University Wexner Medical Center</p>	<p><i>Dr. Mysiw talks about the goal of this research -</i> “What we’re looking to do is help these people regain more control over their bodies.”</p>
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Produced by:



1800 West 5th Ave.

Columbus, Ohio 43212

Phone: (614) 932-9950 Fax: (614) 932-9920 www.mediasourcetv.com

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Media Relations Department: (614) 293-3737**