Seizing Life, episode 92
Epilepsy Stories and the Research Making a Difference
(Transcript)

Kelly Cervantes:	00:00	Hi, I'm Kelly Cervantes and this is Seizing Life, a biweekly podcast produced by CURE Epilepsy.
Kelly Cervantes:	00:18	This week on Seizing Life, we present three short videos about three key areas of research on which CURE Epilepsy focuses. Post-traumatic epilepsy, SUDEP, and refractory or drug resistant epilepsy. Each of these videos presents the personal story of a CURE Epilepsy community member, along with information and insights from a CURE Epilepsy funded researcher working in that area. We begin with the story of US Army Captain Patrick Horan and his wife Patty. Patrick developed post traumatic epilepsy resulting from a traumatic brain injury suffered while serving in the Iraq War. We also hear from Dr. Pavel Klein, Director of the Mid-Atlantic Epilepsy and Sleep Center, who is currently involved in post-traumatic epilepsy research.
Patrick Horan:	01:05	I had been in Iraq for a year. On July 7th, 2007, I was going at night with a recon across the street with some Iraqi soldiers and they shot at us. I got shot in the head and I got what's called a penetrating traumatic brain injury. Basically my skull was crushed.
Dr. Pavel Klein:	01:28	TBI stands for Traumatic Brain Injury, and it's just a fancy term for head injury. You can get it by falling down the stairs, you can get it by having a car accident on the highway or by being assaulted. The military obviously is at high risk for incurring it by virtue of their job, both in combat and outside of it.
Patty Horan:	01:51	Within 24 hours, he was on a flight to Bethesda Navel. When I arrived to Bethesda Navel, Pat's condition was a lot worse than I had imagined. The first morning I was briefed by the neurosurgeons and some of the doctors and they gave me a long laundry list of things that could go wrong in the first couple of weeks. But the thing that really stood out to me was the fact that he could have a seizure. And these seizures, if they happen, they could lead to his death. So every day was a win that he didn't have a seizure.
Dr. Pavel Klein:	02:27	Some patients who have traumatic brain injury developed epilepsy afterwards called post-traumatic epilepsy, and it can happen within weeks, months or years afterwards. Approximately 80% of patients who do develop epilepsy after traumatic brain injury, do it in the first two years or so after the head injury. And what we are not all that great at right now is predicting which patients with the risk for developing epilepsy actually will develop it.

Patrick Horan:	02:53	I was in the RIC in Chicago and I had been there for three months and everything was going good for me. Speech was okay. PT was going pretty good.
Patty Horan:	03:06	Yeah. Make a lot of progress, it was good. About two in the morning, the whole bed was shaking. I woke up, Pat was making horrible noises. And I thought, "This is it." We were doing rehabilitation, he survived Iraq, all this, and now he's dying, right here in front of me. So I ran out, got the nurses and they came in and identified it as a grand mal seizure, it lasts about five minutes. And then things calmed down, and then another started, which is considered a rolling seizure, which is very dangerous.
Patty Horan:	03:34	He was on a Dilantin drip for 24 hours, he was almost comatose for a week. And when he came back to us, he'd lost speech, he'd lost cognitive function that he'd gained, and he couldn't get out of his wheelchair again. And this began the seizure cycle. So this began trying different medications almost every month. He would seize, he would go backwards. It was a horrible cycle that took us almost a year to get out of. And these seizures were just really get getting in the way of progress. And we were afraid they were going to, and probably did honestly affect his long-term recovery.
Dr. Pavel Klein:	04:19	CURE Epilepsy's DOD Posttraumatic Epilepsy Initiative is a unique project in that it is team science, so it brings laboratories and clinical projects from different labs, different parts of the country with different interests in the field of posttraumatic injury. And they work together, so they share ideas together, they share their results. The goal of which is to better understand how epilepsy develops after head injury and how we can better predict its development.
Patty Horan:	04:50	There's a couple of months that go by before these guys usually have their first seizure. So if they can treat them early, they might even be able to find treatment that prevents the whole epilepsy cycle.
Dr. Pavel Klein:	05:02	That is my ultimate goal, to develop treatments to prevent epilepsy after head injury. In our project, we're looking for bar markers that would better tell us who is at high risk for developing posttraumatic epilepsy. A bar marker is an indicator, whether it be something in the blood or an electro-physiological measurement that tells you that a disease is occurring. A good example of that are the blood enzymes that are used routinely for diagnosis of heart attack. So we are evaluating patients with bad head injury, who do have a risk of developing posttraumatic

		epilepsy, and we're looking at their blood for genes and proteins to see whether those can tell us better who is at very high risk of developing post-traumatic epilepsy.
Patty Horan:	05:50	If we could just figure out some of these biological markers and genetic factors, it also might lead to better treatment in general, better drugs with less side effects, which would save so much pain, suffering, even death from these service members as they're trying to rehabilitate after sustaining such horrible injuries.
Dr. Pavel Klein:	06:12	Approximately 5% of all epilepsy is caused by a head injury, but there's another 15% that's caused by other acute brain insults like stroke or infection. Between the three of them, about 20% of all epilepsy is caused by these insults. And we know when they happen and if we can bring in treatment that prevents epilepsy after them, that would really make a tremendous difference in people's lives.
Patrick Horan:	06:39	I just think it's the greatest thing if they could keep going, the CURE Epilepsy and the DOD, and they can figure it out. And so people like me and other soldiers, they wouldn't have to take any medicine at all and that would be so great. That's kind of what I'm looking for myself.
Kelly Cervantes:	06:57	SUDAP or Sudden Unexpected Death in Epilepsy, is one of the most devastating results for a family impacted by epilepsy. Sadly, though his seizures were well controlled, Anthony Maffie passed away from SUDEP when he was only 22 years old. His mother Lisa Maffie and his aunt Barbara Manley tell Anthony's story, discuss what they wish they had known, and share how they keep his memory alive by raising funds for SUDEP research. Dr. Nuria Lacuey explains what we know about SUDEP, what can be done to mitigate risks, and what we hope to learn through research to help prevent SUDAP in the future.
Lisa Maffie:	07:43	Anthony had his first convulsive seizure a month before his 16th birthday. Due to the way the EEG looked, they thought he should start on meds, which he did. He had another seizure shortly thereafter, changed the medications, and then did really well for three years. And then had a few more seizures, medications were adjusted. He did go long periods of being seizure free. He had a total of seven convulsive seizures. His seventh one was when he was 22 years old and had been seizure free for two and a half years. And the seventh one was the one that was SUDEP.

Dr. Nuria Lacuey:	08:25	SUDEP stands for Sudden Unexpected Death in Epilepsy. It usually happens at night after a seizure and patients are found death in bed. We call it SUDEP when there is no other cause of death after ruling out trauma, toxic or drowning death.
Lisa Maffie:	08:42	Anthony was so full of life, a golfer or a rugby play or a fisherman, but he also was a hardworking student and he worked part-time at a community hospital as a certified nursing assistant. And so he worked his usual shift on January 2nd, 3:00 to 11:00. January 3rd, went back for his next shift, 3:00 to 11:00. Came home, talked to his younger brother about their plans for the next day, they were going in to watch a Celtics game. And then on Friday morning when Anthony didn't wake up at the agreed upon time, Austin went in and called his name. He didn't respond. Austin turned the light on and went over to him and knew something was wrong, Anthony was face down he was gone.
Barbara Manley:	09:29	The day that I got the text from Lisa's coworker telling me that Lisa left because her son had called to say that Anthony wasn't breathing. And I thought, wait a minute, when you're in bed, you're the safest. I don't understand how this could happen.
Dr. Nuria Lacuey:	09:46	So that can happen to anyone with epilepsy. We don't fully understand why or exactly how it happens. But what we know is that after having a seizure, there is a problem with breathing. And if this is not resolved quickly, the heart also stops.
Lisa Maffie:	10:04	Although we don't know exactly what causes SUDEP, I researched and learned that he indeed had some risk factors and was in a high risk category. He was diagnosed before the age of 16, he was male, he had convulsive seizures at night. He had a job that sometimes left him sleep deprived from 3:00 PM to 3:00 AM, he occasionally used alcohol. But Anthony's seizures were well controlled. And so this is one of the reasons why SUDEP really needs to be a part of a discussion with every patient with epilepsy.
Dr. Nuria Lacuey:	10:40	Doctors are not required to discuss SUDEP. Some don't do it because they don't think a patient is at risk or because they don't want to necessarily alarm the patient or family. But actually what we know is that patients and families really appreciate being informed. And this really highlights the need to drive awareness and education in both patients and providers.
Lisa Maffie:	11:06	Anthony's clinicians never talked to me about SUDAP. But when Anthony was diagnosed with epilepsy, I did some research on my own and I brought the concerns to his pediatric neurologist

		who told me, "It's rare and Anthony is not at risk." And then when he switched to an adult neurologist, an epileptologist, I brought it up again and was told that the goal is to get control of the seizures, which Anthony had, stay on his meds and easy on the alcohol. But that was the extent of the discussion of SUDEP.
Barbara Manley:	11:37	What we struggle with the most is that Lisa asked about SUDEP and the conversation wasn't continued to the degree that it should have.
Dr. Nuria Lacuey:	11:47	The main risk factor for SUDEP is the presence and frequency of generalized tonic-clonic seizures. These are the typical grand mal seizures. Having three or more per year increases the risk of SUDEP by 15 times. The most important approach for SUDEP risk reduction is decreasing seizure frequency. We need to emphasize the importance of medical treatment adherence and surgical counseling for drug resistant patients. Also stimulate patients after seizures trying to wake them up may help recovering. And therefore, nocturnal supervision and seizure detection devices may be useful.
Lisa Maffie:	12:29	When I came across CURE Epilepsy about two years ago, what really drew me was all of the research that's being done.
Dr. Nuria Lacuey:	12:36	What I'm doing currently is researching respiratory changes in the brain with a two year CURE Epilepsy Grant. We know that when patients die, what happens is that after the seizure, they can't breathe. So they, they breathe very shallow at the beginning and then they stop breathing. We think is that the breathing arrest, the respiratory arrest is where it stop the heart. My hypothesis is that we can find areas in the brain that we can actually stimulate and they are able to enhance breathing.
Dr. Nuria Lacuey:	13:16	What I'm doing is electrical stimulation in patients with epilepsy who already have electrons implanted in their brains for epilepsy surgery. What I do is electrically stimulate these areas and measure the respiratory changes that take place. The goal is to improve the overall understanding of breathing control by identifying a specific brain areas that are most important for breeding function. With this research, we aim to find the way to stimulate and reusing the brain and enhance breathing. Eventually, we want to help the design of devices that could prevent SUDEP by sensing respiratory arrests and stimulating those brain regions that can help enhance brilliant and eventually prevent SUDEP.

Barbara Manley:	14:14	Lisa and I are continuing to seize any opportunity we can to talk about SUDAP because we do hope that these conversations will continue to happen. And of course the ultimate goal is to cure epilepsy. But until we do that, we have to start talking more about SUDAP and the risk factors.
Lisa Maffie:	14:30	We had a lot of fundraising efforts from the high school, doing a volleyball tournament to a local yoga community, doing a class to honor Anthony to Honeydew Donuts, where my son works, who has Anthony Maffie Day on his birthday every summer to raise money for epilepsy and for SUDEP. Because if we cure epilepsy, then we stop SUDEP, and that is my main goal in honor of my son.
Brandon:	15:08	Hi, this is Brandon from CURE Epilepsy. Since 1998, CURE Epilepsy has raised over 85 million to fund more than 270 epilepsy research projects in 17 countries. Learn what you can do to support epilepsy research by going to cureepilepsy.org. Now back to Seizing Life.
Kelly Cervantes:	15:29	Channing Seideman shares her journey with refractory or drug resistant epilepsy, how it impacts her day to day, and why it's important for her to support epilepsy research. Dr. Detlev Boison provides information on refractory epilepsy and discusses his preclinical research study to understand how to block the enzyme that prevents the brain's natural seizure terminator, adenosine, from working properly.
Channing Seideman:	15:55	I was nine years old when I had my first seizure. My dad, my brother and I were staying up late playing Risk. And through the windows, we saw strobe lights. We all made our way to the front porch and there was a Jeep pulled over and a man was getting tested for a DUI. I remember him walking the line. And the next thing I remember is being in my dad's arms pulling up to the ER. Five months after my first seizure, we found ourselves back at the hospital in November of 2003 after my second seizure. And because I had then had multiple seizures, we were given the diagnosis of epilepsy. In more recent years, we found a pattern with increased seizure activity that is resembling of catamenial epilepsy. So I've kind of had a journey with epilepsy diagnosis throughout 18 years.
Dr. Detlev Boison:	16:59	As Channing's example shows, where epilepsy started relatively benign and got worse and worse over years. So if we could interrupt this process and stop epilepsy from becoming worse and refractory, that would make a huge difference for those affected by epilepsy. Refractory epilepsy is any form of epilepsy that cannot be treated with any of the available anti-epileptic

		medications. And that's a huge problem because it affects around 35% of all individuals with epilepsy and that translates to over 20 million persons worldwide. My research focuses on how the brain itself controls seizures and how the brain controls the development and progression of epilepsy. And the key molecule implicated in both processes is the brain's own seizure terminator, adenosine. We found that reduced adenosine increases the likelihood for seizures but also drives the process that turns a healthy brain into an epileptic brain and finally to disease progression into refractory epilepsy.
Channing Seideman:	18:12	We've tried just about every medication to date. They all caused general malaise, fatigue, dizziness. Eventually the amount of medication I was on ,the side effects from that impacted my quality of life worse than the seizures themselves.
Dr. Detlev Boison:	18:29	We hope to develop a disease modifying therapy that would transform the treatment options for those affected by epilepsy. And we do this by blocking the enzyme adenosine kinase, which is the major adenosine removing enzyme. I'm very grateful for funding through CURE Epilepsy which allowed us to perform pilot study in mice. When we were able to show that this short term treatment alone prevented epilepsy in over 50% of all test animals.
Channing Seideman:	19:03	I was a horseback rider prior to epilepsy, it was an Olympic dream of mine. Once epilepsy entered my life, it became equine therapy. Thanks to a fantastic support team, I am still able to ride. To continue to ride, I wear the highest rated safety helmet and easy release stir ups. But I also wear an inflatable vest. This vest has an air cartridge in it that connects to my saddle. So when I come off the saddle in less than 0.9 seconds, it inflates and it protects my neck, my vital organs, and my back. While I'm very fortunate to be able to still horseback ride, it's a fight against epilepsy to get in the saddle. So now I fight to ride and I ride for a cure through an event that takes place every November called Dressage For a Cause.
Dr. Detlev Boison:	19:56	Our current research is a direct continuation of the prior CURE Epilepsy funded work. So we now have our own drug discovery program. And our goal is to identify novel adenosine kinase inhibitors that effectively prevent epilepsy. The biggest advantage of this approach is that we can use this therapy only transiently, which basically means that a few weeks of treatment is enough to prevent epilepsy in its progression. And this would obviously alleviate side effects and long term treatment.

Channing Seideman:	20:31	It's important for me to support CURE Epilepsy in its research because I started out as a straight A student with dreams of becoming a doctor and going to the Olympics. I was diagnosed with epilepsy, a word I had never heard before. And my As went to Fs, I became the patient instead of the doctor. And it is a struggle for me to get to the barn. My hope for the future of epilepsy research is that it gets the funding it deserves so we can find a cure.
Kelly Cervantes:	21:14	The research presented in today's three stories represents just a fraction of the epilepsy research currently being funded by CURE Epilepsy. We have been funding patient focused epilepsy research for more than 20 years and we are dedicated to finding new therapies and cures for those living with epilepsy. Please help us continue advancing science towards a cure by visiting cureepilepsy.org/donate. Through research, there is hope. Thank you.
Legal Disclaime...:	21:51	The opinions expressed in this podcast do not necessarily reflect the views of CURE Epilepsy. The information contained herein is provided for general information only and does not offer medical advice or recommendations. Individuals should not rely on this information as a substitute for consultations with qualified healthcare professionals who are familiar with individual medical conditions and needs.
Legal Disclaime...:	22:13	CURE Epilepsy strongly recommends that care and treatment decisions related to epilepsy and any other medical conditions be made in consultation with a patient's physician or other qualified healthcare professionals who are familiar with the individual specific health situation.