

## Stem cells: A step toward improving function after spinal cord injury

### Introduction:

Early research at Mayo Clinic using stem cell therapy to treat spinal cord injuries has produced results for one patient that doctors describe as "beyond expectations."

[The clinical trial](#) enrolled 10 adults to treat paralysis using stem cells derived from belly fat. Early trial findings show that patient response varies, and some participants may have no change in function.

However, after treatment, as part of the study, Chris Barr of Lafayette, California, demonstrated improvement in motor and sensory functions, and had no significant adverse effects, according to a case report published in Mayo Clinic Proceedings.

Chris, his wife, Debbie Barr, and Dr. Mohamad Bydon, a Mayo Clinic neurosurgeon, explain what happened before, during and after treatment.

	<b>AUDIO</b>
Chris	"It was Feb. 12, 2017."
Chris	"I went surfing at Ocean Beach, San Francisco, like I had every weekend for 10 years."
Chris	"And ... I fell. And I went head first into the ocean floor with enough force to break my neck in eight places. The worst of the break was at my C3, which means you stop breathing, as well, so paralyzed below my neck."
Chet	"I saw a body float up."
Chris	"A buddy of mine saw me from the beach, miraculously, and dragged me in. That's Chet White."
<b>Chet White Chris' friend</b>	"I was able to run maybe 100 yards out, grab this body by the shoulder."
Chris	"There was actually a nurse on the beach who started CPR."
Chet	"And the paramedics showed up ... and they whisked him away."
	"Everything comes into focus, and there's a doctor

<b>Chris Barr</b> <b>Spinal cord injury patient</b>	zooming in. And he's saying: 'Mr. Barr, you've had a catastrophic neck injury. You're paralyzed from the neck down. You can't talk because you're intubated.'
<b>Debbie Barr</b> <b>Chris' wife</b>	"When I got there, the first words he mouthed to me were, 'Pull the plug,' ... which was so shocking."
Chris	"And then my sons came and visited, and that was very powerful. And then, finally, Chet came in ..."
Debbie	"... He said there's technology, new developments every day. Why would you throw in the towel? You've got nothing to lose."
Chris	"We heard about the Mayo stem cell trial ..."
Debbie	"... and at that point, it was game on."
Chris	"I actually got off the respirator, but I'm still completely paralyzed. But all of a sudden, things started happening."
Chris	"I could wiggle my toes, my feet, my arms a little bit. I think right around that time is when I grabbed a piece of chocolate, and I put it in my mouth."
Debbie	"Oh, that was here at home."
Chris	"But all of that progress stopped at six months. It flatlined."
Chris	"And that's when ... Dr. Bydon had us come out to Mayo."
<b>Mohamad Bydon, M.D.</b> <b>Neurosurgeon</b> <b>Mayo Clinic</b>	"We wanted to intervene when that improvement was plateauing, so that we don't let the trial take credit for improvement that would have occurred anyway."
Dr. Bydon	"It was really a natural fit ... as we opened the trial to offer Chris the chance to be patient No. 1."
Dr. Bydon	"So we take a small amount of fat from the belly, and those cells are mesenchymal stem cells. Those cells are then expanded in a petri dish ... in a culture setting. Once the cells expand out to 100 million cells, they are then injected into ... the patient's lumbar spine."

Dr. Bydon	"And the cells then migrate to the ... highest area of inflammation — their area of spinal cord injury."
Chris	"And I could feel it. I absolutely felt something in my legs."
Chris	"So literally two weeks, I do walk tests. I do hand strength test. I do finger motor test. Every single one of them improved again by 25% to 50%."
Chris	"Clearly, something happened."
Dr. Bydon	"The cells helped regenerate, so they augmented ... Chris' healing."
Chris	"The first time I started walking by myself, that was really something."
Dr. Bydon	"To be able to see him stand up and walk towards me was really just an extraordinary feeling."
Dr. Bydon	"And I wanted all of the investigators in this space to see that."
Chris	"We got to actually walk around the table and shake their hands. And they were blown away. I could tell them, 'Look, what you're doing is having impact, and you're making a difference.' It was pretty emotional for them and for us."
Debbie	"We couldn't thank them enough. Like, what you're doing matters. You're changing people's lives."
Chris	"1, 2, 3, 4."
Dr. Bydon	"The recovery that he had was beyond our expectations, and being able to see that is very gratifying."
Dr. Bydon	"It's also important to keep in mind that not every patient will have this same benefit."
Dr. Bydon	"In fact, up to a third of patients or more may have no impact whatsoever with this treatment."
Dr. Bydon	"But these trials are what help us advance the field and how to help patients improve with a spinal cord injury."
Chris	"Chet, thank God, you were there, buddy."

Chet	"Hey, thank God — you know, it was my lucky day, too. I promise you."
Chris	"I can't say it enough times that the stem-cell regimen and protocol offers hope."
Chris	"The stem cell trial is such a huge part of that because, again, you know, the hopelessness of paralysis is just like, unlike anything you can imagine. And this is the hope."
Chris	"It's nice to be able to come back here on my own two feet."

**Tag/outro:**

It's important to emphasize, this was early research that examined safety and dosing. Further study is needed to scientifically verify the effectiveness of stem cell therapy for paralysis from spinal cord injury.