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SCIENCE

Cutting-Edge Medicine Brings Hope with Caveats

Produced by [Gabriel Spitzer](#) on Friday, June 12, 2009

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The immune system is what protects us from getting sick. But sometimes it gets its wires crossed, and causes devastating diseases like lupus, multiple sclerosis and type-1 diabetes. If only the immune system had a reset button. Well, a scientist in Chicago thinks he's found it, in a novel transplant using adult stem cells. But some say there's a fine line between innovative and reckless, and this new procedure may be moving too fast.



Richard Burt of Northwestern Memorial Hospital pioneered the immune system "reboot," that's showing promise across a range of diseases. (WBZZ/Gabriel Spitzer)

The idea is pretty simple ... clever, even. And it came to Doctor Richard Burt about 20 years ago, when he was working with transplant patients.

BURT: It was standard to reimmunize them for their childhood vaccines: measles, mumps, polio. Because they had lost their lifelong immune cells that can recognize those viruses and attack 'em. And I realized that's exactly what you want to have happen in autoimmune disease.

In people with auto-immune disease, their immune defenses have turned on them. Burt thought by destroying and rebuilding the immune system, he could bring the body back to its senses.

BURT: The default of your immune system, when it's first developing is tolerance to self. It's like rebooting a computer.

Over time, Burt and his team at Northwestern Memorial Hospital developed a ground-breaking procedure: They harvest a patient's immune stem cells – these are a source of the other cells that fight disease. Next, a jolt of chemotherapy: this wipes out the person's immune system. Finally, doctors reinject the stem cells, remaking the immune system from scratch.

GILTMIER: They were my stem cells, so I thought well, I wasn't doing so great with them the first time, but the second time might be a good thing.

Beth Giltmier was diagnosed with M-S in 1994 ... her own immune cells were eating away at tissue in her nervous system. And Giltmier couldn't afford to slip -- she's a Chicago police officer.

GILTMIER: If I can't think, I obviously cannot operate a pistol, I can't drive a car, I can't try to help people solve their problems.

Before long, her meds got less effective. Her short-term memory flagged. She'd have to grope for words.

GILTMIER: I would say, oh, can you give me that ... the thing ... it's a porous material ... and it holds liquids. Oh, yeah, it's a glass.

In 2005, Giltmier got into an early trial with Richard Burt. She went through the chemo – she lost her reddish-brown hair, dropped even more weight. But then she got her stem cells back.

GILTMIER: Oddly, within a few hours, I thought, well, this has gotta be psychosomatic

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because I feel a little better.

That feeling didn't go away. This was a one-time treatment ... and four years out, Sharon Giltmier says she still feels almost disease-free. Richard Burt says 17 of the 21 patients in that trial improved.

BURT: It's the first trial that didn't just show progression of neurologic decline, it reversed neurologic disability. So that is very hopeful.

Hopeful not just for MS: the same immune system reboot seems to help people with Lupus, Crohn's Disease ... and, recently, with juvenile, or type-1, diabetes. In one small trial, most diabetic patients could stay off injected insulin for months ... even years. But those diabetes results have come with controversy. Demolishing the immune system brings built-in risks of infection or death ... for a very sick person with bleak prospects, that may be a chance worth taking. But some think it might be too soon for diabetes.

SCOTT: The risk profile is much different for a person, a young person, whose disease can really be managed quite well with our existing therapies.

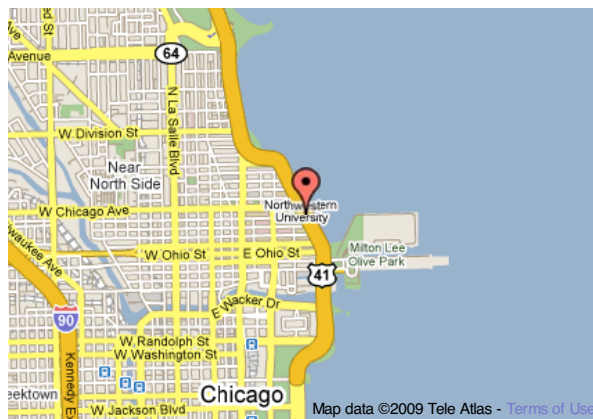
That's Christopher Scott, head of Stanford University's Program on Stem Cells and Society. He and other ethicists say this procedure brings up a fundamental tension in medical research. Obviously, we want promising procedures to go forward ...

SCOTT: The question is how fast. And that's where the all the debate is, really. There needs to be a tradeoff between moving cautiously, but not so cautiously that we paralyze research.

Richard Burt insists his studies are designed carefully, and carry a mortality rate under 1 percent. What's more, he says diabetes is no minor disease – the risks just come later on, with the threat of stroke or heart attack. For so many people whose bodies have turned on them, the stakes are high.

BURT: Perhaps the most precious thing we have that we take for granted is our health. A normal life is a very, very valuable thing.

Burt likes to say that he never uses the word "cure." But for a sick, suffering person, "normal" sounds pretty good.



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