

# Bionic Limbs Replacing Traditional Prosthetics

Latest Technology For Amputees Uses High-Tech Computers

By HERMES BOYATIS  
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WASHINGTON -- For 40-year-old **John German**, a simple task like dealing a deck of cards was nearly impossible. That is until three months ago, when he became one of only 15 people around the globe to get an i-Limb, one of the world's first bionic hands.

"I can do things better," German said. "I can do things more efficiently. I can do things faster and better."

The i-Limb replaces older prosthetics, which only let users move their thumb and pointer fingers in a claw-like motion.

This new prosthetic uses a battery to power the hand, which has an opposable thumb and moveable fingers.

Sensors and electrodes placed in the limb are lined up to match muscle points in what's left of the arm. So as the muscles contract, the electrodes sense the impulses, causing the fingers in the prosthetic to move.

German lost part of his left arm to disease nearly 20 years ago. He was forced to live life with only one hand, until he got the i-Limb. He's now helping his wife in the kitchen and even writing with his left hand.

"To look down and see a hand that articulates, moves like a real hand does have some sort psychological impact on self image and on how you, just how you perceive this, quote, disability," he said.

"When I was growing up, I'd fall down four or five times a day," said **Brooks Raney**, a prosthetist with Hanger Orthopedics. "I can't remember the last time I've fallen down with the C-Legs."

Raney was born missing part of his right leg. He's since dedicated his life to helping others with lost limbs. But it wasn't until he got a C-Leg with a

bionic knee that he's been able to do so many of the things he wanted to do. It's because the knee is powered with a microprocessor.

"If someone comes to me and says, 'Will I ever be able to run again? Will I ever be able to dance again? Will I ever be able to drive a car again?' I can absolutely tell them, 'Yes,'" Raney said.

The computerized knee analyzes the way an amputee walks so that it can make automatic adjustments, like if they speed up or slow down.

Both Raney and German agree that in the future, devices like the i-Limb and C-Leg will continue to evolve. They said to expect to see prosthetics that sense texture, heat or cold.

"If you were able to do it before and you have the desire and the will to do it again, then the technology is there and we can make it happen," Raney said.



C-LEG WITH A BIONIC KNEE

## The i-LIMB Hand



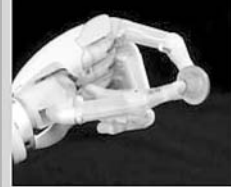
### KEY GRIP:

Where the thumb closes down onto the side of the index finger. This grip is used to hold items such as a plate or a business card. The addition of wrist rotation enables the patient to turn a key in a lock in a totally 'human' way.



### POWER GRIP:

Where all fingers and the thumb close down together to create a full-wrap grip. This grip would be used to hold a can of drink whilst opening the ring-pull, for example, and for carrying large objects such as a briefcase and/or shopping bag.



### PRECISION GRIP:

Where the index finger and thumb meet (or index finger, middle finger and thumb meet) in order to pick-up small objects and to hold objects when performing finer control tasks.



### INDEX POINT:

Where the thumb and fingers close but the index finger remains extended – patients have found this grip very useful for operating computer keyboards, telephone dial pads, ATM cash machines and a host of other everyday requirements.

## “Rev Up Your Engines! Let the Race Begin!”

By HERMES BOYATIS

“It’s really important to give back to the reason I’m still here.” Speaking is **Brent Eckert** of Red Lion, Pennsylvania, in a remarkable burn survival story reported by **Erin McCracken** of the York Daily Record.

“The house is on fire,” was the cry from **Barry Eckert** to his wife **Barbara** in the family’s farmhouse. Panic and terror gripped them all: 4-year-old **B.J.** in the living room downstairs; 3-year-old **Brian** underfoot in the kitchen; and 22-month-old Brent sleeping soundly in his third-floor crib.

What followed was a breathtaking show of a father’s courage and a mother’s deep fear. One after another, Barry pulled B.J. and Brian from the flaming house while Barbara drove Brian and B.J. to the nearest neighbor for help.

In his last fight with the flames, Barry used a ladder he had earlier borrowed to search for Brent on the 3rd floor. Choking from the thick smoke, he pulled the baby out. He had already fractured both wrists when he smashed the upper window to enter. Knocked off, he went up again and, unbelievably, gave Brent mouth-to-mouth resuscitation on the way down the ladder until the baby breathed.

McCracken’s account of the survival of the baby, horrendously burned over 70% of his body is detailed. A local doctor, **Dr. Joseph Danyo**, sponsored the child’s transfer to the Shriners Hospital for Children in Cincinnati, Ohio.

In the years of treatments which followed, Brent moved forward. He saw pity in people’s faces; job refusals because of his face; and eventually a job.

Now 37, Brent is driven by his dad’s work ethic, shares labor on cars, stripping and racing with his own sons **Devin** and **Damien**.

For the past four years they have been racing at Trail-Way Speedway in Hanover. So far Brent has made \$610 in money won at the races and looks forward to donating it to the Shriners Hospital.

Brent, we’re with you: “Rev up your engines!”

## A Mission of Hope in Nogales for Mexican Children

By HERMES BOYATIS

IN a series of reports in early October 2007, KXLY (Spokane, WA and Northern Idaho) anchor **Dave Erickson** described the treatments given at a screening clinic in Nogales, Arizona, by members of the staff at the Shriners Hospital for Children in Spokane, Washington, 1500 miles away. There is care provided on-site at the clinic, such as casts and prosthetics, and also screening for surgical procedures and treatment at the Shriners Hospital in Spokane. The work done at these one-day clinics has forever transformed the life of untold numbers of Mexican children who could not otherwise get the care they desperately needed in order to lead normal lives.

The clinic is run through a volunteer medical mission in Nogales, Arizona, consisting of **Dr. Glenn Baird**, Assistant Chief of Staff at the Shriners Hospital in Spokane; Care Coordinator **Diane Huffman**; and others, who travel to the St. Andrews School in Nogales, Arizona, as they have done bi-monthly for the last eight years. They provide treatment for children on-site, and screen others for surgery at the Shriners Hospital for Children in Spokane.

One child, five-year-old **Luis**, had suffered from club feet, but thanks to Dr. Baird, his feet have been straightened out. Now he can walk straight, and play soccer. Baird added that one in a thousand worldwide is born with club feet and at least 90 percent of cases are untreated.

The clinic was founded by **Dr. Mark Frankle** in 1972 on the Mexican side of the border. Now on the Arizona side of the border, the clinic attracts more than 200 children on the first Thursday of each month. Over the years, the clinic has treated thousands of children for whom a lack of treatment meant possibly never walking. Our plaudits to these volunteers!

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