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New prosthetic limbs 'celebrate' bodies, personalities instead of hiding lost limbs

By [Stephanie Siek](#), CNN

(CNN) — Most people have two legs. [Aimee Mullins](#) has 28.

Mullins' 14 pairs of prosthetic legs are more than medical devices. They are wearable sculpture, secret weapons and a passport to embrace and show off the thing that makes her superficially different — the fact that she has no flesh-and-blood legs below the knee.

As a Georgetown student, Mullins was the first amputee to compete in NCAA Division I track events. She broke world records in three track and field events during the 1996 Paralympics, walked the runway for [Alexander McQueen](#) and starred in avant-garde movie "Cremaster 3."

But she's also at the forefront of a [movement](#) that redefines what a replacement limb can be — not a replacement for something lost, but a supplement, an enhancement. The custom-designed legs with which she broke records are modeled on the hind legs of a cheetah, and look nothing like human legs. The

ones she wore on the runway are intricately carved wood. In the film, one pair was made to look as if it was made of freshly tilled earth.

“Hopefully for so many more people now, they’re getting to the heart of the journey to celebrate their body and choosing their own identity,” Mullins said. “They don’t have to stay in that place of doubt and uncertainty and feeling like they’re ‘less than.’”

There are nearly 2 million people with amputations in the United States, according to statistics from the [Amputee Coalition](#), a nonprofit group that serves people who lost a limb. About 185,000 amputations are performed each year and many removed limbs are replaced by prosthetics.

A new generation of prosthetics, particularly those for lower limbs, means that an amputee can revel in the label of “that person with the awesome chrome leg” instead of “that disabled person who lost a leg.” These limbs, while restoring physical functions like walking or standing, also offer amputees the chance to personalize and accessorize in the same way that a fashionista might change hair color or shoes, or an athlete might change from hiking boots to running shoes. They’re made to inspire a sort of envy rather than pity.

For most of modern history, prosthetics were used to mimic the shape and appearance of a lost limb. In the last century, the contraptions of wood, ivory and steel gave way to rubber and various plastics that tried to replicate human skin tones and textures. But many seemed not so real as transparently artificial, descending further into the “[uncanny valley](#),” a robotics term that describes what makes humanoid robots creepier than their full-metal cousins.

Now, technological advances and new attitudes toward what constitutes a disability have enabled a wider view of what prosthetics can look like.

[Peggy Chenoweth](#), 36, had her left foot and ankle amputated after her foot was crushed by a falling computer monitor in 1998. For five years, she lived with numerous surgeries, infections and pain as doctors tried to restore the foot’s function. Deciding to amputate and replace it with a prosthetic was the hardest decision she ever had to make, Chenoweth said.

“I was initially afraid of the pain of the actual surgery, then afraid I wouldn’t be able to use the prosthetic,” Chenoweth said. “I thought I would end up being a totally different person. I thought that what I had dreamed for my life was never going to happen because I didn’t have my foot.”

But Chenoweth has gone on to a happy and full life with her 5-year-old son, Robby, and husband, Scott. She’s gone rock climbing, participated in a run for breast cancer, and trains for a triathlon. She’s an active [blogger](#) and social media manager and volunteer in her son’s classroom.



Chenoweth customized her running leg to read “sisters” when she did a breast cancer survivors’ run – she and her sister both beat breast cancer.

For the first few years after getting her prosthetic in 2003, Chenoweth always covered up the metal and plastic components with a flexible cover made to imitate the look of skin. But her current one has metal raindrops tattooed over the plastic socket – a look which has bolstered her confidence in her body image.

“I went through a few years of trying to match – it was so important to me for it to look like the other leg,” Chenoweth said. But “it’s not my other leg, and that’s OK.”

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| APRIL 1, 1940 | | | | | | | | | |
| PERSONS 14 YEARS OR OVER | | | | | | | | | |
| 1. SEX | 2. RACE | 3. MARITAL STATUS | 4. OCCUPATION | 5. INDUSTRY | 6. TRADE | 7. SERVICE | 8. OCCASION | 9. PLACE OF BIRTH | 10. PLACE OF BIRTH OF FATHER |
| Male or Female | White, Negro, or Other | Married, Widowed, Divorced, or Single | Occupation | Industry | Trade | Service | Occasion | Place of Birth | Place of Birth of Father |

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I haven't gone back to the cosmetic covers."

Chenoweth also has a carbon fiber leg that she decorates with Christmas lights for the holidays. Robby loves using stickers to give it a personal touch.

"People are going to look at it anyway, so I might as well make it an expression of who I am," Chenoweth said.

Bespoke Innovations, a company that makes custom, 3-D printed panels for prosthetics called fairings, is one company seeking to facilitate the desire for self-expression. **Industrial designer Scott Summit** founded the company in 2010.

Bespoke Fairings – the panels the company produces – are **designed** to bring to mind a luxury concept car or the pattern of sunlight beaming through tree leaves. They can be made of polymer, ballistic nylon, leather or chrome, and their shape restores some of the contours of the lost limb.

Summit said he's seen dramatic changes in the way amputees saw themselves and their limbs before and after being fitted with fairings.

"We saw one woman who was very introverted, suddenly become very outgoing in the larger world," Summit said. "She started wearing skirts when she hadn't been announcing to the world previously that she had been an amputee at all. It became more akin to wearing beautiful Italian leather boots instead of a prosthetic in the traditional sense with a bunch of pipes and fittings and mechanical couplings."

Bespoke Fairings have the look of luxury, and right now they cost \$4,000 to \$6,000 per panel; that's separate from the price of the actual prosthetic, which can range **between \$5,000 and \$50,000**. Summit hopes that cost goes down as technology improves and becomes less expensive. So far, the San Francisco-based company has produced about 100 fairings.

Nobody chooses to lose a limb, but having a choice about **how the world sees you afterward** is essential, said Mullins, the athlete and model.

"It's absolutely essential to the role of identity in this – we absolutely have to chose our own, and make and remake," Mullins said. "That liberation that comes from abandoning the need of having to look like everybody else is something I wish for everybody."

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Posted by **Stephanie Siek -- CNN**
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soundoff (27 Responses)

SMARKASS

I have to HAND it to these people. They really have a LEG UP when it comes to design. If they were more affordable many more amputees would RUN right out and buy them Being as they currently cost an ARM and a LEG, this will just serve to

CRIPPLE sales, I'm afraid. Be HOPPY!!

May 7, 2012 at 4:41 pm | [Report abuse](#) | [Reply](#)

Dave T

Can we create a newly (CNN fans viewers) company, that also produces new exoskeleton suits (just google it), for other people with limited mobility? Perhaps it may be a stroke patient, people in pain (back, knees) or others so to get around better. Too many people, may gain a bunch of weight, by not being able to exercise. Can we utilize smart phones, to take pictures of patients current movement abilities, to see what kind of (exoskeleton) suit or brace they may need. Then a specially fitted bike, back brace, or swimming gear could also be produced. This would give people the opportunity to exercise braced with these items. The YMCA or other health center's pools could be used to exercise. Secondly, we have baby boomers aging fast. Many will fall. Can some of these new exoskeleton suits or braces be made to keep people stabilized while walking? Can other parts or robotic items, be developed so baby boomers could stay in their homes longer? Again smart phones could take pictures of the bathrooms or kitchens; then develop a blueprint for items to keep these areas safe. I believe if we all put our talents together, we may develop such a plan. Am I missing something with this proposal? Or do you have something to add or person to contact to make this concept to that of reality?

May 7, 2012 at 12:33 pm | [Report abuse](#) | [Reply](#)

Xed0

"I never asked for this"

May 7, 2012 at 5:25 am | [Report abuse](#) | [Reply](#)

S

These are really cool. Too often prosthetics try to mimic limbs and end up in "uncanny valley" territory. These are bold and stylish! No mistaking them for real limbs, and that's the point! I much prefer these. They look like enhancements, not sad attempts to replace something that was lost.

May 6, 2012 at 7:16 pm | [Report abuse](#) | [Reply](#)

kkijowski

This story is so inspirational. People are always worrying about how they look and what other people think of them. The fact that she looks at her amputation as a good thing is amazing. Not only is she doing things, such as running in marathons, that most people who don't have an amputation do, but she is actually excelling in her tasks. Also, the fact that the companies are also trying their hardest to make the prosthetic pieces as appealing as possible is a big milestone. Now that our technology is getting better, the outcomes of the lives of people who are suffering from amputations can look at it as a blessing instead of a catastrophe.

May 6, 2012 at 5:17 pm | [Report abuse](#) | [Reply](#)

Nate

This is great. What a wonderful concept. This is the kind of innovation and creativity we need to be focusing our energies on while thinking about how to survive economically in this world market.

May 6, 2012 at 7:59 am | [Report abuse](#) | [Reply](#)

GoDucks73

Very cool, right out of a sci-fi movie. I think the customization will lend itself to help people become more comfortable around an amputee and see that people are people with or without a limb.

May 5, 2012 at 10:35 pm | [Report abuse](#) | [Reply](#)

bigdumbdinosaur

I've got to hand to these amputees: making the best of an unfortunate situation and enjoying life. Good for them.

May 5, 2012 at 1:52 pm | [Report abuse](#) | [Reply](#)

Teresa

Good for them they did not a disability stop them. Hopefully they will make it more affordable for the average person. \$5,000 is a lot of money for most of us.

May 5, 2012 at 12:28 pm | [Report abuse](#) | [Reply](#)

p4p

our war heroes should get them at a discount. hey government, you want to spend money? spend it on our wounded warriors and not on your enemy... third world countries that will side with the enemy in moments of peril. but again, thanks

for signing partnership agreements (again, with the enemy).

May 5, 2012 at 5:08 am | [Report abuse](#) | [Reply](#)

bigdumbdinosaur

Better yet, quit spending our tax dollars on career welfare recipients and divert that money into helping our wounded veterans and their families. Unlike the welfare crowd, military people are doing something for this country.

May 5, 2012 at 1:55 pm | [Report abuse](#) | [Reply](#)

Kay

Hate to have to tell you this, but a lot of our welfare recipients *ARE* veterans. Just like a lot of our homeless are veterans.

May 6, 2012 at 12:19 pm | [Report abuse](#) |

lyrker

Gorgeous parts. Amputees should have more options. We're living in the future!

May 4, 2012 at 11:44 pm | [Report abuse](#) | [Reply](#)

Both Financial Extremes

Inspiring article. THAT SAID, it's a crying Shame that the brave young men & women who've served our country will Never be able to afford! We have so many Wounded Warriors/Soldiers returning after losing limb to IEDs & the wars in general. THIS is Definitely a place which should obtain philanthropists/Angel Donors to help our kids/men & women from war. The majority of soldiers make nothing financially & the VA's don't properly take care of them. Such a shame & embarrassment! Angel Donors, please help the wounded with these. God bless all.

May 4, 2012 at 9:18 pm | [Report abuse](#) | [Reply](#)

Kay

Where do you get the idea that our returning vets won't be able to afford such things? Or that there aren't already philanthropic organizations helping returning vets? If you want to help, actually spending some time checking on what already exists would be a GREAT place to start. Far better than making false assumptions and stereotyping.

May 6, 2012 at 12:21 pm | [Report abuse](#) | [Reply](#)

ms. a

She did say "majority of soldiers" so I don't see any assumptions and obviously her heart's in the right place...why are you all up on a high horse trying to argue with people's good intentions?! Give it a rest lady!!! So annoying reading your comments!!!!

May 6, 2012 at 10:24 pm | [Report abuse](#) |

Daughter

Its sad that these are so expensive that most people could never dream of having them. It's hard to get insurance companies to pay for a regular prosthetic in fact I think most do not. My mother had to take out a loan to pay for just a regular use one.

May 4, 2012 at 4:14 pm | [Report abuse](#) | [Reply](#)

Kay

Can't afford???

The woman who has the leg that looks like raindrops said it cost her an extra TWO HUNDRED BUCKS!!! It was only the fancy designer company that charged between \$4,000 and \$50,000. That's like saying that someone who can't afford a Porche can't afford a car. Yeesh.

May 6, 2012 at 12:30 pm | [Report abuse](#) | [Reply](#)

IveBeenEverywhere

If I had to have one, I would have one designed by Cyberdyne Systems.:)

May 4, 2012 at 4:06 pm | [Report abuse](#) | [Reply](#)

blondiechick

i think that anything people can do to help society move accepting when it comes to prosthetics the better. My step brother had his legs amputated when he was six months old, and ever since i met him my mother though us he was just like the rest of us. i hope one day they can do the same with hands and arms

May 4, 2012 at 3:28 pm | [Report abuse](#) | [Reply](#)

Keenan

Those are kinda cool. Ive never been so jealous of an amputee..

May 4, 2012 at 3:21 pm | [Report abuse](#) | [Reply](#)

ForGoodOfAll

Very artistic and interesting prosthetics. Due to the recent wars in Iraq and Afghanistan, there should be a big market for artistic prosthetics. Hopefully such devices will be available in styles that are more affordable for average folks.

May 4, 2012 at 1:46 pm | [Report abuse](#) | [Reply](#)

Hugh Jass

Right now my legs run about \$18,000 apiece. Insurance covers most of that, but I still pay hundreds. They wear out in two to four years.

May 7, 2012 at 10:32 am | [Report abuse](#) | [Reply](#)

Husband of below-elbow amputee

My wife quit wearing prosthetic arms years ago because of the "uncanny valley." Is anyone doing this for upper extremity prostheses?

May 4, 2012 at 12:08 pm | [Report abuse](#) | [Reply](#)

lollerball

So your wife would rather not have arms than look strange to others? Derp.

May 6, 2012 at 7:10 am | [Report abuse](#) | [Reply](#)

fireandair

Um... not having arms is looking strange to others, you know. Besides, upper body prosthetics are less advanced. There's these things called "hands" that are at the end of your arms, and they do a far more complex job than feet and ankles. It's just harder to replace that function mechanically. So most upper-limb prosthetics are simply there to make others less uncomfortable, but they get in the way enormously for the people who wear them. They're just heavy lumps of stuff strapped to your chest that don't do a thing for you. If I needed an upper-limb prosthetic, I'd consider just going without, too - because I'd care more for my own comfort and ease of movement than making other people less queasy around me.

May 9, 2012 at 11:46 am | [Report abuse](#) |

Justin

Yes. Any design can be added to upper arm prosthetic also. I am an amputee that is having an arm built for me. I am doing all the customization myself and my doctor at hanger is more that happy to work with my designs. These designs are just a dye cut from a 3d cnc machine.

May 7, 2012 at 5:11 pm | [Report abuse](#) | [Reply](#)

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