

# Changing the world one leg at a time: U-Idaho researcher breaking down barriers for amputees

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One leg, two legs or no legs, it's all about living a normal life. Unless you're South Africa's Oscar Pistorious, a double amputee who will be the first ever amputee to compete in the Olympics on the track – thanks in part to a team of researchers, including University of Idaho's Craig McGowan.

Born without fibulas or the small bones in the calf, Pistorious is looking for more than an ordinary life -- he wants an extraordinary life. Despite a storm of controversy and several hurdles, he will compete for South Africa in the Men's 400 meters and the 4 x 400 meter relay in the London Olympics.

“I've never seen anything like him. Oscar is a one-in-a-million athlete, he has extraordinary ability,” said McGowan, who watched Pistorious run during testing. “He is amazing. I definitely will be rooting for him.”

The biological sciences assistant professor joined in the research of Pistorious' gait, energy consumption and running mechanics, collecting data to present to the International Association of Athletics Federations to rule whether Pistorious' carbon fiber running blades had an advantage over flesh and bone. It was an intense three days of running and collecting and analyzing data. The verdict?

“The mechanics of how he runs is different, but I've seen no data that

suggests an advantage,” said McGowan. “We don’t understand enough, and based on what we don’t know, we can’t exclude him without evidence. He has earned his right to compete.”

In the tests, where Pistorius had to both jog for extended periods of time and run full out for several short periods, McGowan said he burned just as much oxygen and didn’t generate the same force against the ground as an intact runner. While his blades’ elasticity is different than muscles, he was still using as much energy to run. It’s the “mechanically different” label that continues the debate.

“We ran him into the ground,” said McGowan, who was up late each night to analyze data and determine what needed to be collected the next day. “We pushed him hard, but he was determined.”

It’s especially poignant for Pistorius. Five years ago, the IAAF ruled prosthetic blades gave an advantage for runners, and they shouldn’t be allowed to compete with intact athletes.

That decision, according to McGowan and his group of researchers, had scientific flaws. Pistorius searched for a second opinion and McGowan was brought into the research process for his expertise on musculoskeletal relationships and how they interact to create movement in humans and other animals.

His research has now expanded to include the study of prosthetics and the mechanical and neurological adaptation of how the neuromuscular system uses these devices.

Beyond the Olympics, McGowan’s research has a wider impact. Continuing research with professional athletes who use prosthetics, McGowan’s work aims to provide for a better, more natural prosthetic that could help amputees function on a level playing field. Using

bilateral and unilateral amputees, McGowan can better understand the mechanics of muscle versus prosthetics.

“There is a very distinct difference between unilateral and bilateral amputee function. We can use that data to better understand how the prosthetics work,” said McGowan. “We know what works, but not why.”

With a growing population of [amputees](#) in the military, these advances could help people return back to duty after an amputation. McGowan has applied for a grant from the military to turn his research toward building better prosthetics that would offer more natural movement.

“It’s opening doors, showing people there are no limits, they are no different” said McGowan. “Whatever you choose to do, you can return to healthy, active living.”

In the end, whether it is going for the gold or walking with a surer stride, it’s all about equality.

“You are not disabled by the disabilities you have, you are able by the abilities you have,” said Pistorious on his website, [www.oscarnpistorius.com](http://www.oscarnpistorius.com) .

To watch Pistorious compete, the Men’s 400 meter races will occur Aug. 3-5 and the 4 x 400 meter relay will occur Aug. 9-10.

Provided by University of Idaho

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