

Oscar Pistorius barred from Olympics



Oscar Pistorius is an athlete and a double below knee amputee. He wants to compete in the Beijing Olympics against able-bodied athletes. The International Association of Athletics Federations (IAAF) won't let him, as they believe that his prostheses give him an unfair advantage over non-amputees.

That wearing a prosthesis is better than having intact legs is probably a surprise to most readers of *Amplified*, many of whom struggle to get through daily tasks without pain, discomfort, frustration or fatigue. In fact, the conventional view for many years has been that prostheses are inherently less efficient than anatomical legs. And the higher the amputation, or the greater the number of amputations, the less efficient movement is. This has been supported by oodles of scientific research over the years.

So, what gives?

Well, Oscar's prostheses aren't any old prostheses. He runs on Ossur Cheetahs, a high tech carbon fibre 'blade'. These are effectively leaf springs designed just for running. They look nothing like a conventional leg and, indeed, are rather awkward to walk on.

Their difference is such that the IAAF sponsored a German university to do thorough testing of these prostheses last year. The results of this study were released in January. They indicated that Oscar would be able to run with about 25% less energy expenditure than an able-bodied runner. This was due to the capacity of the Cheetahs to store energy in one part of a stride and return it later in the stride. The study estimated that the returned energy was three times greater than from a human ankle.

Seems clear cut. Cheetahs efficient, bodies not so efficient.

However, not losing energy is only part of the picture. Running, and indeed walking, also requires propulsion and lots of it. The major sources of propulsion are the thighs and calves, and Oscar Pistorius, as a double BK amputee, is lacking in calves. No prosthesis replaces this lost propulsion, they are all passive devices which try not to *lose* energy, but certainly don't put any energy *in* to locomotion. If they did then we would expect paralympians to be regularly beating their able-bodied colleagues.

The IAAF report acknowledges this point, noting that the Cheetahs are only more efficient once a given speed is reached. Oscar *must* be less efficient at getting to speed, but *may* be more efficient once at speed. Might not these two factors balance out? Shouldn't Oscar be given a sporting shot against able-bodied competitors?

Perhaps the issue here is not what Oscar can do now, but what others may do in the future. Maybe one day prostheses really will be more efficient than anatomical limbs, and it will be fair to classify them alongside performance enhancing drugs as an unfair advantage. I'm sure many *Amplified* readers are looking forward to that day. In the meantime Oscar has appealed the IAAF decision. We wish him well.

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