

## **MEDICAL BREAKTHROUGHS**

### **RESEARCH SUMMARY**

TOPIC: 4663 BLADE RUNNERS: FUTURE OF PROSTHETICS  
REPORT: **MB #4663**

**BACKGROUND:** Prosthetics designed for athletes have a 40 year legacy. These ingenious “blade” prosthetics shied away from earlier heavy designs and focused on the mechanics of muscle movement. Their invention spurred an athletic renaissance in which amputees run competitive distances, climb mountains, and downhill ski. Running blades were invented by American inventor Van Phillips, who lost his lower leg in a water-skiing accident in 1976. Depressed by the limited athletic function of prosthetics at the time, he enrolled as a student at Northwestern University Medical School’s Prosthetic-Orthotic Center. He quickly recognized that while most prosthetics tried to mimic human bones, he could focus on replicating ligaments and tendons. He came up with the idea for running blades by observing animals like kangaroos and cheetahs, as well as the mechanics of diving boards and pole vaulting. The result was Flex-Foot – his model of carbon fiber blade prosthetics and the name of his company. His contribution to the history of prosthetic legs has inspired generations of athletic amputees.

(Source: <https://www.amputee-coalition.org/running-blade-prosthetics/>)

**CARE:** A prosthesis can be particularly subject to perspiration as it is enclosed in a plastic socket. This can be a source of odor and bacteria, as well as the culprit behind skin problems. Sprinkling the residual limb with baking soda, or if needed, apply an over-the-counter antiperspirant such as CertainDri may help. The more consistently the prosthesis is worn, the more the residual limb will adjust to being inside the socket, with perspiration naturally subsiding. It’s important to keep a good supply of prosthetic socks on hand. Swelling and volume fluctuation may occur but a shrinker sock is useful to reduce swelling and should be worn when you are not wearing your prosthesis.

(Source: <http://hangerclinic.com/limb-loss/resources/living-with/Pages/Limb-and-prostheses-care.aspx>)

**NEW RESEARCH:** Alena Grabowski, PhD, Biomechanics at CU Boulder talked about the hurdles for developing better a better prosthesis, “Running’s a little bit trickier than walking because it’s so much faster. So if I were to try to design a running-specific prostheses that would enhance running, it would be something that had a very lightweight motor, something that allowed very quick feedback, something that was actually connected to the person so the person could actually drive that prosthesis, not just react to it. And so, there’s a lot of aspects that would have to be perfect to really make that prosthesis work the best.”

(Source: Alena Grabowski, PhD)

#### **FOR MORE INFORMATION ON THIS REPORT, PLEASE CONTACT:**

Lisa Marshall  
303-492-3115  
[lisa\\_marshall@colorado.edu](mailto:lisa_marshall@colorado.edu)

**If this story or any other Ivanhoe story has impacted your life or prompted you or someone you know to seek or change treatments, please let us know by contacting Marjorie Bekaert Thomas at [mthomas@ivanhoe.com](mailto:mthomas@ivanhoe.com)**