

Chemistry Helps Athlete Keep Moving

1. Why did Chandler's parents agree to have his leg amputated when he was just 18 months old?
2. Why are a prosthetic leg and foot separate, instead of making one prosthetic leg/foot combination?
3. Who paid/pays for Chandler's prosthetic legs?
4. List three requirements for a prosthetic leg, to ensure it will last.
5. List the properties of silicone elastomers that make them suitable for use as the liner for a prosthetic limb.
6. What are these silicone polymers made of?
7. What property makes titanium biocompatible?
8. What are the properties of carbon fibers, and what effect do these properties have on Chandler's prosthetic foot?
9. Describe the results of the two heating processes, the first at 300 °C and the second at 400–600 °C, using polyacrylonitrile to make carbon fibers.
10. What is done to the carbon fibers manufactured according to the above process to make them a strong material?
11. Describe osseointegration.
12. Considering all the benefits of an implant mentioned in the article, was this type of prosthetic leg the best option for Chandler's situation? Why or why not?