

Ossur Power Knee

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The Ossur Power Knee is the first powered bionic prosthesis for above knee amputees. It is unique because it is able to predict the next step to take based on the activities of the amputees sound leg.

The Power Knee consists of three parts. These parts are the Orthosis, APM, and the prosthetic leg. The Orthosis is worn in the shoe of the user's functional leg. This is where the sensor technology consisting of gyrometers and pressure cells and load cells are strategically located. The sensors constantly and accurately measure motion, position and velocity of the sound side, with every step.

The next part of the Power Knee is called the APM which is worn around the ankle of the sound leg. This device receives the sensory measurements from the Orthosis and uses this information to determine what function the prosthetic leg must carry out. The APM uses blue tooth technology, similar to the kind that is found in cell phones, to tell prosthesis what to do. The system also evaluates gait symmetry and in effect stimulates highly efficient gait patterns. This is important to help decrease strain on the back, hips and the user's active leg. The software in the APM can be fine-tuned to fit the needs of each individual amputee.

There are many benefits of having this powered prosthesis over other, more traditional, prosthetic legs. With this prosthesis, standing and sitting are easier and more efficient than ever. The Power Leg actually lifts the user out of the chair with its powerful motor. In addition to this, climbing up and down stairs is also easier than ever as the leg lifts the user up every other step and gently lowers them down. Many users are now able to climb a flight of stairs, foot over foot, for the first time with a prosthesis. The power knee also identifies when there is an increase in slope and amputees are able to climb steep inclines. Users have described how they are able to cover larger distances without increasing fatigue because of the efficient gate and the leg is doing the work for them.

The Power Knee runs on a battery that lasts

approximately 6 hours with continuous use and has a 4 hour charge time. Experts suggest charging the Power Knee every night while sleeping. The weight of the artificial leg is about 10.36 pounds which is



heavier than most other prosthetics, however, the average human leg weighs about one sixth of the total body weight. In addition to this, the Power Knee has a life time of approximately five years or about three million steps. These prosthetics are available to the public, but cost 120,000 dollars compared to the 20,000 dollars it costs for a normal prosthetic leg. Because of this price,

health insurance companies are refusing to cover the cost of the Power Knee for their clients.

Ossur's Power Knee is designed for unilateral transfemoral amputees but there are tests being done to see if two of these legs are suitable for double amputees. Currently only two Iraq war veterans are successfully using two Power Knees to walk. The amputee moves their thigh muscles and after one or two steps, the AI recognizes the motion and begins to take steps forward. The two legs mimic each other's motions rather than a sound leg. This shows that the future of Ossur's Power Knee is promising. Soon it will help double and single amputees alike.

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