



## Birmingham Public Schools ♦ Disability Awareness Workshop

**Prostheses**—a device, either external or implanted, that substitutes for or supplements a missing or defective part of the body

- Improved materials and technologies are enabling many individuals with disabilities to return to activities they previously enjoyed.
- Custom fabricated and custom fitted prostheses require high strength and low weight. Accordingly materials originally developed for aerospace applications are often utilized in the fabrication of prostheses. Advancements in technology continue to improve patient care outcomes. Technological breakthroughs such as electronic knees and computer imaging are changing the way prostheses are enabling patients to fulfill their potential.
- Materials used in each device depend on the weight of the user, their desired activities and their personal preferences. Flexible polymers provide increased comfort for patients. Carbon fiber, Kevlar and titanium are all used for reducing the weight and increasing the strength and durability of the device.
- CAD/CAM (Computer-Aided Design/ Computer-Aided Manufacturing) technology is increasingly being used to help design and fabricate models from which prosthetic sockets are produced. Measurements can be scanned in by laser or by using a special hand-held wand. This information describing the size and shape of the limb allows the prosthetist to design the device for the patient by using the computer. Now the design can be downloaded to an automated carver to make the prosthesis.
- Many arm prostheses have electrically powered hands and elbows. Simple switches may be used to control these, but it is also possible to use sensors on the skin to detect signals generated by muscles (myoelectric signals) to control the prosthesis. In some instances microprocessors are used in analyzing and processing the myoelectric signals. Users of this kind of "bionic arm" can have both the delicate touch to pick up an egg and the strength to grasp a heavy object.
- Electronic knee joints for prostheses can now be programmed for the individual patient. A computer chip allows the knee joint to sense changes in position, speed and force, enabling patients with amputations to walk down stairs and hills with confidence.
- There are prosthetic feet made especially for running, golfing, or swimming.

<http://www.opcareers.org/>

