Safety Review:

Our product has been approved as "safe for use as directed" by Dr. Glen A. Livesay, Assistant Professor, Department of Biomedical Engineering, Tulane University. A safety manual has been provided for our client.

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Project Pressure Relief

Our Client:

Our client is a wheelchair user with only partial motor control of her legs.

The Problem:

Our client prefers to sit with her right leg crossed over her left. However, her left knee puts pressure on her right leg and after a while it begins to ache. She has to move her right leg to relieve the pressure. With only limited control over her legs, she is unable to do this without assistance.

The Goal:

To design a device that would allow our client to independently relieve the pressure on her right leg at any time.

Design Criteria for our device:

- Battery powered
- Quiet
- Easily removed from the wheelchair
- Aesthetically unobtrusive
- Able to raise our client’s foot by almost 7 inches to relieve the pressure in her leg
- Able to be independently operated by our client

Our Device:

Our plan was to use attach a battery operated pump to an inflatable bladder positioned beneath our client’s right foot. Inflating the bladder would provide the lifting motion to relieve our client’s pain.

We designed a device to constrain the bladder during inflation and guide the movement of our client’s foot. The device also provides support for our client’s ankle, which tends to flex outward when her foot is pushed up. The device is easily attached to our client’s footrest using two c-clamps. Finally, it is fitted with a tube that can be attached to any one of several pumps owned by our client.

Final Product:

Before inflation

After inflation

The tubing provided with the device has a valve attached to the end of it. If the pump chosen does not provide a back-pressure, the valve can be used to maintain inflation of the device.