

I PRO 319  
Budget/Project Plan

This semester, we hope to create a device that will control and regulate the gas mix for cardiac arrest victims in order to prevent oxygen reperfusion injury, while continuing to pursue the work of last semester's group of creating a cooling device for cardiac arrest victims.

Due to the fact that most of the cardiac arrest victims die from brain damage, which occurs due to a lack of circulation and oxygen. Our device will properly induce the optimized amount oxygen along with a certain gas mix, which will reduce the brain cell's metabolism. Thus, the brain cells will not require as much oxygen, and the death rate of brain cell will reduce.

The device will consist of an open circuit loop with 2 gas tanks. One tank contains 100% oxygen, and the other contains a mixed blend with air and anesthesia gas. In order to function, the gas from the 2 tanks will come out and mix in a counter lung, than pass through a oxygen sensor, which is connected to an oxygen percentage computer. The computer is also connected to automatic valves on the tanks. In this way, the computer can control how much gas will be injected into the counter lung, based on the input from the oxygen sensor. Finally, the proper mixed oxygen rich gas will be delivered from the counter lung to the victim.

Meantime, another oxygen saturation sensor on the victim is reporting the oxygen saturation level in his/her blood and sending it to the gas mix computer. The computer than analyzes the victim's blood oxygen saturation percentage and calculates the optimum oxygen percentage in the gas mix that needs to be delivered.

The computer is also programmed so that it will gradually increase the pure oxygen level in the counter lung to nearly 100 %. Research suggests this process may reduce the amount of brain damage and death caused by cardiac arrest.

The group also hopes to continue the work of last semester by carrying out tests with the cooling prototype. Additional materials may need to be purchased, but these expenses should be relatively low, and are unknown until actual testing begins.

The majority of time and effort will be spent on production and testing of these devices. By the midterm review, the group hopes to have functioning devices so the second half of the semester can be devoted to fine-tuning and testing. The last two weeks of the semester will be entirely devoted to preparation for I PRO day, and any last minute modifications.

A rough list of materials needed this semester follows:

1. Computer processing hardware - <http://www.phidgets.com/index.php>  
- \$80.00
2. Oxygen Sensor – <http://www.rebreatherexpress.com>  
- \$70-\$90

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3. Finger Oxygen Sensor -  
<http://www.portablenebs.com/tripleoximeter.htm?gclid=CPmw8Lv13ZUCFQqdnAod4yXAYQ>  
- \$58.95
4. Oxygen Tank x 2 - <http://store.sealsmedical.com/lu-m006-018.html>  
- \$59.95
5. Oxygen Regulator x 2 - <http://www.vitalitymedical.com/>  
- \$100-\$200
6. Hose - <http://www.vitalitymedical.com/>  
- \$25
7. Mask - <http://www.vitalitymedical.com/>  
- \$5
8. Mixing Chamber - ?  
- ?

This is only a preliminary list of materials that will need to be purchased. New items will most definitely be added to the list as the semester progresses and actual work is conducted on creating the device.