Bio-Lung

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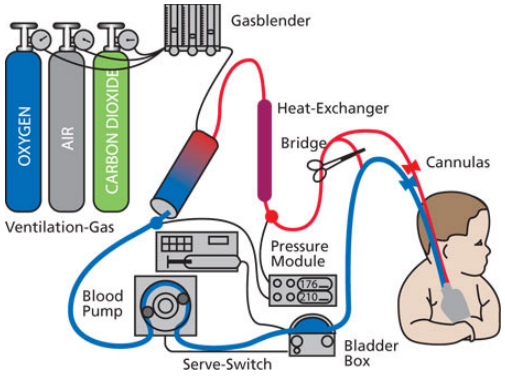
***Abstract*—Those who are in need of vital organs such as a lung have little hope, and have had to solely wait on a long list for donor programs. However, there is a response for this need.**

I. Introduction

TIME is often of the essence in the medical world. Unfortunately, in the United States, there is a critical shortage of donor organs, which is not a good mix with the lack of time. However, the development of one such as the Bio-Lung, serves as a temporary supplement until a patient may have the opportunity for a transplant. The research of this Bio-Lung is held by surgeon Robert Barlett at the University of Michigan Medical Center, with the help of the Michigan Critical Care Consultants in the production of the device. After 8 years, and much support from scientists at partnership universities, a device has been developed that to do what yesterdays machines could not.

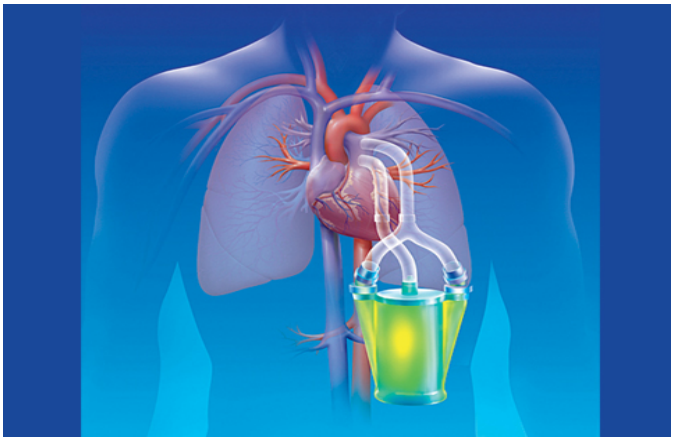
II. Methods

To supply 100% of patients' oxygen needs by using the heart's own pumping power. After 8 years of mark-ups to meet particular requirements and hit specific performance peeks, this is known as the Bio-Lung. The system used in hospitals is known as ECMO-Extracorporeal membrane oxygenation. These systems take over the processes for both the lungs, and heart. They do this by pumping blood and exchanging carbon dioxide for oxygen outside the body. A blood-thinning drug is administered to keep the blood moving throughout the machine without clotting. If clots were to form, damage can be done to vital organs such as the brain. The ECMO unfortunately uses a mechanical pump that damages red blood cells. The Bio-Lung, does not use a pump, nor does blood ever leave the body. This Bio-Lung is implanted into the chest and is the size of a soda can. The patients heart pumps its own blood into the device, which is packed with hollow plastic fibers perforated with holes so that only tiny gas molecules can pass through them. Therefore carbon dioxide escapes through holes and replaced by oxygen.



III. Results

This system works best for patients who have had respiratory failure because of infections, such as pneumonia, or trauma, such as smoke inhalation. The machine is used as a temporary "bridge" until patients' lungs have healed enough to begin breathing normally.



IV. Discussion

ECMO is strictly a short-term life saver, and is not recommended for long-term use. Many patients with diseases such as cystic fibrosis, pulmonary fibrosis, and emphysema, do not have the power to survive on ECMO long enough. The Bio-Lung is the improved supplement. It is not ment to be a lifelong replacement for diseased lungs. At best, researches hope to buy time for those awaiting a transplant and let them live relatively normal live until they wait.

References

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