Dialysave: Affordable Dialysis Designed for Developing Countries

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There is a tremendous need for accessible renal replacement therapy. In countries such as India and Pakistan, 90% of patients in need do not have access to the lifesaving treatment. Inspired by this real world issue, I have focused on building a simple and highly affordable dialysis machine designed for use in developing countries. Such a device has the potential to help make this dialysis accessible in impoverished countries. The main barrier to the widespread use of a dialysis machines is it's cost. The price-tag on a home-hemodialysis machine is typically $25,000, whereas my Dialysave prototype costs less than $500 to produce. This prototype is designed following the steps of the hemodialysis process, a standard method of filtering blood. The blood is pumped, from the body into the dialysis machine where it is filtered and then returned to the patient. Dialysave, my second generation prototype, can be disassembled by almost anyone to enable quick repair. Also, its small size makes it easily transportable to sites where a natural disaster has taken place. It was tested on the blood of 8 donors pooled into a bag of 4L. Multiple tests were conducted in a research lab at Hema-Québec and the results show that the device can adequately remove excess toxins and waste products out of whole blood. There are many improvements left to be made, but the Dialysave prototype shows that it is feasible to develop a hemodialysis machine for low-income settings.

Awards Won: