Prototype for Real-Time Hydration Monitoring Using BIA

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In this project a prototype was designed by the student researcher to test basic hydration levels. The engineering goal was to design a compact, easy to use device to allow for real time monitoring of hydration levels. The initial device design required the use of hand-to-hand electrodes that were connected to a battery and controlled using external hardware. This hardware was operated by computer code written by the student researcher. In the second tier of testing, the electrodes were replaced with an OMRON fat monitor that utilized impedance to measure fat percentage. The fat monitor output was then translated into total water content to determine hydration using the aforementioned hardware and code. The code was written to provide a warning alarm when a 2% decrease of total body water content was detected. This percentage is based on standard dehydration levels as reported in the literature for athletes. All testing was performed on the student researcher. The validity of the device was verified using urine strips. A device such as this could easily be accessible in any setting to alert people of real time hydration levels before more serious health risks arise.

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