Are you kidneying me?

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If you are in need of a kidney transplant today you would most likely have to wait longer than you want. The problem is that the time window for organ retrieval is short to ensure the kidney function is maintained. To increase this time window, a new technology for restoring kidney function has been developed and patented by UGLK Science AB. In this project, the exterior for the machine used in this technology is re-designed to improve the user experience with the goal of increasing the number of kidneys available for donation.

The method used in this technology is called ex vivo perfusion, which means that instead of placing a donated organ on ice, the organ is placed in a machine simulating a human body pumping blood through the organ. Not only does this restore organ function, but it also helps transplant experts to evaluate the donated organ before transplanting it into a new patient. Fluids are pumped through the kidney, simulating a human body.

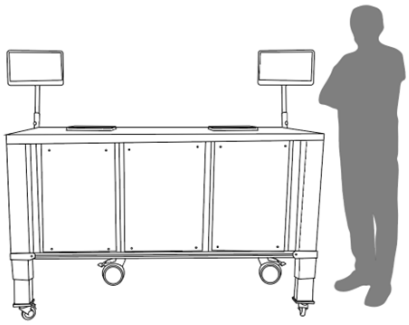

Figure 1. The original machine from UGLK Science.

In this project, one main challenge was the fact that the machine is to be used in an environment where there are very high requirements in regards of hygiene. To make sure the design of the machine met these requirements risk analysis was part of the project. The other main challenge was understanding the process and user journeys to ensure the design is made with the user in focus. In a hospital environment, users are often tired due to long shifts, and the machine should not demand more energy from them than absolutely necessary. Another important aspect of the design challenges is how to ensure trust for the design, both with the user and the patients. The user must feel comfortable enough to use the machine, or the goal of more kidneys for transplantation can never be reached, and the patient must trust the machine to provide a kidney with restored kidney function without worrying about infection. To communicate this sense of security to the user creates a challenge, not only because of the difficulty in defining how this can be communicated, but because you need to gain empathy for the user to understand their needs.

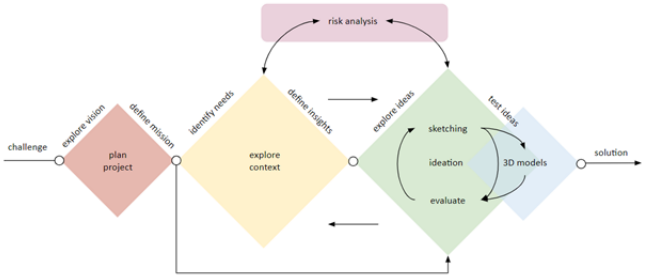

Figure 2. The design process.

The overall method for this project was an iterative design process since the machine was under development at the company parallel to this project. New data and new needs and requirements were found throughout the project, and therefore there was no clear end to phases such as data gathering or ideation. Risk analysis was an important aspect since the machine would be used in a hospital and was used as a design perspective and a method for evaluation.

The final design of the machine has a smooth exterior with soft colours and rounded corners. On the front of the machine there is an LED-strip that communicates the amount of time passed, or the amount of time remaining until the next step in the process. The side of the machine in equipped with a touch screen that can be adjusted to the user's preference and is where the user will control the machine. To allow the user to move the machine, wheels and a handle are added. On the top of the machine the user would interact with the pumps and most importantly, the kidney.

Figure 3. The final concept.