**ORGANS TRANSPLANTATION DATABASE PROJECT**

We would like to introduce this project by saying that organ donation and transplantation is offering thousands of people across the world a second chance for living. During the past few years it has improved a lot, but it still remains to be a big challenge.

            First of all it is important to understand what is an organ transplantation. It is the surgical removal of a healthy organ from one person and its transplantation into another individual whose organ has failed or was injured. In most of the cases it becomes lifesaving.[[1]](#footnote-1)

            Organ transplantation is an important surgery that has risks such as organ rejection.

            Organ transplants include kidney, pancreas, liver, heart, lung, and intestine among others. Kidney transplants are the most common type of transplant surgery while the least common are intestines. Vascularized composite allografts (VCAs), which is the transplantation of multiple tissues (muscles, bones, nerves, skins, …) is now also possible, involving face and hand transplantation. In most of the cases, donor organs come from deceased donors.

            Depending upon the organ needed, organs are matched using several characteristics, including blood type and size of the organ demanded, tissue type, life expectancy, waiting time and other medical criteria.

            Assigning an organ to a patient needs to be done in a very fast way since, normally, an organ that has already been surgically removed can last between 12 and 48 hours. Also very often the organ has to be moved from one hospital to another and so does the patient, creating an additional barrier that has to be overcome. This is the main reason that inspired us to choose this project, so **time taken in the transplantation process is minimized.**

            In order to fulfill our objective, we have planned to create a database that is capable of keeping track of the transplants that are being performed in a specific hospital. We are basically focusing in **one** given hospital at a time. The hospital acts as the place where all the process occurs. It is equipped with specialized medical staff and facilities, host the organs, tissues and patients with different pathologies.

Sometimes the organ or the patient or even both are not located at the same hospital, and they need to be moved to the same hospital in order for the transplant to be performed; but we are not taking this into account and we assume that the organ and the patient are already in the same hospital.

We will create a transplant waiting list that takes into account all the crucial factors mentioned before (blood type, size of the organ, tissue type, life expectancy, time spent on the waiting list, and other medical criteria), looking for compatibility.

            Our database will be built on seven entities and along this project we will explain how each and every one of them is interrelated.

            When an organ is available, the data base will look for the “ideal” patient that is compatible with it, matching all the required parameters to come up with the “best” receptor.

            The donor and the patient are linked by the organ that is going to be transplanted. In order to do the compatibility test of our database, we decided to differentiate between the organ that the donor is going to give (organ) and the organ that the patient needs (request). This is graphically expressed in the attached diagram.

When a transplant is being carried out, the main factors that take place are the following four: the donor of the organ, the organ that is donated, the organ that the patient needs and the patient that is going to receive the organ. The hospital where the transplant takes place is also a key factor.

Sometimes, the demand of organs is higher than the supply. To minimize this problem scientists have been searching for alternatives since the XVII Century. They discovered that animal organs could be used in humans. Unfortunately, nobody has been able to survive with an animal organ. However, they found out that animal tissues and cells are easier to transplant so, nowadays, doctors are performing these types of transplants called “xenotransplants”.[[2]](#footnote-2)

            To sum up, our database will be able to match the available organ will the “ideal” receptor that will be identified by its profile in a fast and efficient way.

1. Web med:  [**http://www.webmd.com/a-to-z-guides/organ-transplant-overview#1**](http://www.webmd.com/a-to-z-guides/organ-transplant-overview#1) [↑](#footnote-ref-1)
2. http://www.unicolmayor.edu.co/invest\_nova/NOVA\_8/NOVA6\_REVIS1.pdf [↑](#footnote-ref-2)