



The Use of Dialysis and Some Social Implications



Service Sites:

RAI Baltimore Beltsville
10701 Baltimore Ave
Beltsville, MD 20705
Phone: (301)-595-0263

RAI Indian Head Oxon Hill
5410 Indian Head Highway
Oxon Hill, MD 20745
Phone: (301)-749-9307

Da Vita GWU Southeast Dialysis
3857 Pennsylvania Avenue Southeast
Washington, DC 20020
Phone: (202)-581-9446

Greater Southeast Community Hospital
1310 Southern Avenue Southeast
Washington, DC 20002
Phone: (202)-574-6000

Doctors Community Hospital
8118 Good Luck Road
Lanham, Maryland 20706
Phone: (301)-552-8118



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Earth, Life, & Time
Mechanical Engineering



Mission:

Even though I went to multiple service sites with Dr. Osman, all of them had the same mission for their patients. Not only did the doctors and nurses want to heal their patients of the kidney and renal problems they had, they also wanted to educate their patients too. Dr. Osman, a nephrology specialist, oversees the nurses and doctors who work with the patients on a day-to-day basis. Based on the information that he receives from the nurses and doctors, Dr. Osman then advises how long a patient should be on dialysis, how frequent they should be dialyzed, and the amount of medicine a patient should receive, even when they're not on a dialysis machine.

Issue Confronting Site:

The purpose of my practicum project was to shadow a physician who worked around a lot of medical machines. That is why I chose to work with Dr. Osman, a nephrology specialist who works around dialysis machines all day. Being that I am a mechanical engineering major who has an interest in medicine, I thought it would be beneficial for me to be around medical machines. One day I hope to create better machines for medicine, whether it be a better dialysis machine, or other tools used by doctors and specialists every day. This project also helped me learn about the daily life of a specialist who runs his own practice, as he is busier than the average doctor. I also was able to see how a physician makes an informed decision on the way a patient should be treated. Finally, I learned how dialysis machines work as artificial out-of-body kidneys.

Impact of Practicum:

Shadowing Dr. Osman over my Winter Break was very productive for me, not just because it helped to do this project, but because it gave me some insight into what I want to do when I get older. Working in dialysis was fun for me. Even though it involved early mornings and late nights, I didn't mind doing the work at all. Following Dr. Osman around also made me see some social implications of dialysis. It seemed that no matter what dialysis unit we went to, most the people that were there were from low income areas. It was obvious to see that in places like Southeast D.C. and Oxon Hill that it's hard to make healthy choices. There were so many unhealthy things in the areas surrounding dialysis units. In Southeast D.C. I saw nothing but fast food restaurants and liquor stores. It was the same situation in Oxon Hill and at the dialysis center on Baltimore Ave. I realized that the poorer the area, the more dialysis units there were, and the healthier the patients were. Hopefully in the future, we can stop adding liquor stores and fast food restaurants in lower class areas so people, no matter how poor or rich, can all be healthy.

Acknowledgments:

I would like to thank Dr. Osman so much for all of his help for letting me follow him around as he did his work. I would also like to thank him for making this project as fun and interesting as it could be. I would also like to acknowledge his associates Dr. Okang and Dr. Chiroboga (both critical care doctors) for assisting me when Dr. Osman was getting swamped by patients. Thank you all.

Activities:

❖I saw Dr. Osman go through binders of monthly bloodwork reviews for various dialysis patients. The reviews show whether a dialysis patient is getting the correct treatment. If not, then the nephrology specialist who is in charge of the site changes the patients dialysis prescription and the rate that the patient is dialyzed.

❖The bloodwork that I got to see showed the patient's level of phosphorus, red blood cell count, potassium levels, white blood cell count, etc. These results are very important because it shows if something present in the blood could be toxic to a patient. An example is a high count of potassium. If potassium is too high, then the heart stops.

❖Dialysis machines filter out a patient bloodstream. Blood from a patient is pumped and pushed through tubes composed of semi-porous membranes. Salt, urea, and other things that should be filtered from the blood go through the membranes into the sterile solution and are removed from the bloodstream. The machine then pumps back the clean blood into the patient, free of any of the unhealthy things that were in it before.

❖Since I was in dialysis centers and hospitals for so much time, I started to gather some information from patients. I can't use their names or images for privacy reasons, but the average patient that I talked to had to come in for dialysis 3 days a week, and stay connected to the machine for 3-4.5 hours.

❖I also learned that driving is a huge part of a specialist's day, and that having a full tank of gas is beneficial. Dr. Osman visits at least 4 different dialysis units/hospitals a day, and a lot of the time he has to make repeat visits to places he has already been. Maybe a new patient was admitted or a problem may have occurred since he left the place.

❖I was also able to witness what powers all of the dialysis machines. As you can see in the pictures, there is a whole room devoted to making sure the dialysis machines function correctly

❖I learned that pure water is needed for the solution that cleans/filters a patient's blood. The R.O. (Reverse Osmosis) machine makes the purest water for the dialysis machines through a water system.

❖The water system: water comes from the city, but it goes through a softener tank, then a carbon tank, which takes out particles, and then through the R.O. machine, which rejects un-pure water.

❖The water is used in the acid solutions that exchange electrolytes between the machine and the patient. No one wants bacteria or pyrogens to enter a patient's bloodstream, which is why it is imperative that a patient has pure water in their dialysis.

