

**SUMMER TRAINING
AT
P.D HINDUJA HOSPITAL AND MEDICAL RESEARCH CENTRE**

FROM 10TH MAY 2021 TO 2ND JULY 2021

**A REPORT ON IMPROVING PATIENT EXPERIENCE IN ARTIFICIAL KIDNEY
DIALYSIS DEPARTMENT AND DATA VALIDATION OF NURSING INDICATORS
AT P.D. HINDUJA HOSPITAL, MUMBAI**

BY

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**MBA – HOSPITAL AND HEALTH MANAGEMENT
2020-2022**



ACKNOWLEDGEMENTS

The completion of this project would not have been possible without many who supported me and guided me. I would like to express my sincere appreciation to IIHMR University for giving me this opportunity to work on this project.

I would also like to thank my mentor Dr. Daya Krishan Mangal, Professor, IIHMR for his valuable guidance during my project.

My special thanks to Dr. Preeti Goraksha, Senior Clinical Units Manager at P.D. Hinduja Hospital, for helping me with finalizing my project to work on during my internship. She guided me to understand the project and helped me tackle any roadblocks I faced during the period I was at the hospital.

Also, my sincere appreciation to the AKD department Manager Mr. Milind Pathak and the staff at the department who were cooperative and helpful with whatever I needed for my project. Thanks to Ms. Indu Paulose, Nursing Manager I worked for my second project, explaining exactly what was expected of me during the project and guiding me to complete the same.

Last but not least, I would also like to acknowledge with a deep sense of gratitude the sacrifices made by my parents and thus have helped me secure the opportunity to be at this university.

**P. D. HINDUJA NATIONAL HOSPITAL
& MEDICAL RESEARCH CENTRE**

(Established and managed by the National Health & Education Society)

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July 2, 2021

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Prasija J Menon a MBA - Hospital & Health Management student from IIHMR University, Jaipur, did her project in our Hospital from 10/05/2021 to 02/07/2021

During this period her assignment was as follows:

- Improving overall Patient Experience in Artificial Kidney Dialysis Department
- Nursing Quality Indicators Data Validation Study

I wish her all the success in future endeavours.

JOY CHAKRABORTY
Chief Operating Officer

DR. PREETI GORAKSHA
Senior Manager
Clinical Care Units and
Accreditation & Compliance

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INTRODUCTION OF P.D. HINDUJA HOSPITAL & MEDICAL RESEARCH CENTRE, MAHIM, MUMBAI

In the year December 1951, just after the partition, Mr. Parmanand Hinduja understood the need for a healthcare facility to cater to the surge of refugees in then Bombay, where the sanitation in crowded camps was poor, which multiplied the health problems which lead to the establishment of an outdoor clinic, "Seth Deepchand Gangaram Hinduja Health Care". Just a year later, in February 1953, a National Hospital was set up with a capacity of 30 beds.

In 1956, the 'hospital's management was handed over to National Health & Education Society who brought a plot opposite to the outdoor clinic building. The National Hospital was shifted to this plot in 1963 with 100 beds.

In 1976, the National Hospital was renamed as "P.D. Hinduja Hospital & Medical Research Centre" as a tribute to the founder. The concept of full-time consultants was introduced for the first time in Mumbai while maintaining the visiting & part-time consultants at the new setup. An organizational setup with CEO as the head and other functional directors under him was implemented in the year 1986, leading to the start of professional management.

The 'facility's laboratory is NABL accredited, and CAP accredited, the highest certification for safety and quality of food is HACCP which is accredited to only this facility in India. Also, this facility was the second in Mumbai to be NABH accredited. P.D. Hinduja facility also has many achievements under its belt like, the first hospital in India to start a pain management clinic, vulvar clinic, awake craniotomy for epilepsy surgery performed and many more'. Currently, the Chief Executive Officer of the facility is Mr. Gautam Khanna and Chief Operations Officer is Mr. Joy Chakraborty.

The vision of the institution is "Quality Healthcare for all" and mission is as follows: "To create Hinduja Hospital as a World Class medical institution by delivering quality medical care to all patients, as well as continuing medical education to all doctors and training to nurses and by undertaking basic and clinical research with a focus on the needs of the country".

MODE OF DATA COLLECTION:

During the first week of our summer training, we were on our induction period. We systematically observed the various departments comprising the hospital. We observed the

day-to-day process flow, the hierarchy of staff in the department, and the overall function of each department.

GENERAL FINDING FROM THE OBSERVATIONAL STUDY:

P.D. Hinduja has four main buildings in the Mahim facility. To start with the Hinduja Healthcare building which constituted of all the OPD services available and other short-stay services like artificial kidney dialysis, radiation oncology, and endoscopy. The building with the IPDs, ICUs and all the other services is known as the main building which is present right in front of the healthcare building. Both these buildings are connected by a flyover to transfer patients for dialysis, oncology procedures, etc. Furthermore, one of the buildings is known as Lalitha Girdhar 1 or L.G. 1 (named after the resident member). This building comprises laboratories, conference halls, and a fully set up covid facility during the pandemic. The Lalitha Girdhar 2 or L.G. 2 comprises the administrative departments like Human Resources, Finance, BPR, Staff Development Classrooms, I.T. Department, etc.

Outpatient Department (OPD):

The OPD consultation timings are 7 am to 10 am. The OPD rooms are set up on four floors. When a new patient arrives at the hospital, they must get themselves registered, and they are assigned an H.H. (Hinduja Hospital) number. Every time they return from then on, the same number will be used to store their data. Once the patient arrives, fills the forms and registers themselves, they must pay at the admission counter, collect the file and go to the designated floor. Ones who make online registration and payment can avoid filling the form and directly manage the file from the admission counter for their appointment. The patient details are available at the nursing station for each floor the night prior to the appointment who have pre-registered from the MRD department, whereas the walk-in patient's details will be provided by the admission department to the nursing stations.

The specialty offered at the facility is as follows:

- Ground Floor: AKD Department, Radiation Oncology (Consultation as well as procedure room), OPD laboratory for non-fasting tests.
- First Floor: ENT, Speech Therapy, Cochlear Consultation, Ophthalmology, Gastroenterology, OPD X-ray station, Orthology.
- Second Floor: Child Development, Gynecology, Dental, Neurology, Nephrology and Endology

- Third Floor: Cardiology (Non-Invasive), Vaccination Rooms (covid vaccination setup)

Accident & Emergency Department:

The total numbers of beds present are 6. There is one procedure room for minor procedures and five isolation rooms. Any instruments which are required are brought into the department as per the requirements from IPD. The process flow followed in the A & E department is: As a patient arrives, the triage is used to assess the situation and, according to the treatment, is initiated. If a relative is present with the patient, the paperwork requirements are handled by them, and if not, the treatment takes precedence before paperwork or financial matters. Once the patient is stabilized, the choice is presented to the patient if they wish to get admitted at the same facility under which consultant as well (depending on their availability). If they wish to shift to another setup their bill is prepared, and they are ready to be shifted and if they plan to stay, the bill will be added to the IPD billing. If the patient is brought dead and he was an old patient of the same facility, the ' 'patient's consultant takes the call if a death certificate can be issued or else the police are informed. If the deceased brought in is a new patient and cause of death is unknown a death certificate isn't issued, and it is informed to the police as well as per medico-legal regulations. The staff present at the department are 2 associate consultants, 3 Clinical assistants, one junior consultant, 24 nurses.

Covid Regulations: There is a single point of entry into the A & E department. Every covid suspected patient is also brought into the A & E department first. All the patients must go through a rapid RT-PCR test. The result will be available in three hours; until then, the patient is under observation in the isolation bed at the department. If the test is negative, the patient is moved to the IPD or ICU as per requirement, and if positive, they are moved into the dedicated covid building IPD or ICU.

Operation Theatre & Cath Lab:

The O.T. is present on the 3rd and 4th floors. The total number of O.T. present is 11 and recovery beds 8. Each floor has an O.T. sub store which is a storage unit for materials received from stores/pharmacy and CSSD. Every two O.T. stations have a common scrubbing area. The O.T. is connected to CSSD through pneumatic tubes labelled clearly as sterile and unsterile lift. The O.T. is disinfected after every procedure, deep thorough cleaning and disinfection takes place every Saturday and the air sample of O.T. is tested every Sunday.

The staff present at the O.T. are Nurses – 67 to 70, Technicians – 48, Perfusionist – 2, Officers -2. Cath lab is situated on the 2nd floor, one entrance is attached directly to the ICU for ease of moving patients as most patients need to be moved into ICU after the procedure. Each O.T. has been categorized for cardiac, neurology and different specialty requirements. But if non-availability of the same, any O.T. which is free is booked for the procedure.

Laboratory:

The laboratory is situated on three floors which specializes in Histopathology, Biochemistry, Microbiology, Histology, and Immunology. All the tests are carried 24*7 at the lab except for histopathology. There are around 200 lab technicians, clerks, delivery persons, etc., present at the facility. There are fixed timings in a day when the samples are collected from IPD, OPD and brought to the laboratory buildings. The facility carries out 90,000 to 1,00,000 tests every month. The facility has a tie-up with RNTCP which means the samples from all the 24 wards in Mumbai come to this facility. On average, they receive around 100 to 150 samples for testing every day. The laboratory at Hinduja is accredited with CAP as well as NABL accreditation.

Dispatch:

Dispatch Department looks after the security, fire, lift, drivers, and dispatch personnel. The overall staff is around 180, of which 75% is on payroll, and 25% are outsourced. All four buildings are under surveillance which is covered by 450 plus cameras. The access to which can be available to the authorized management. Failure patient spends 3-4 hours thrice a week at a dialysis center. As the patient spends a major portion of their time at the dialysis unit receiving the lifesaving treatment, it is important to understand the patient's experiences at the dialysis center. This study helps us to gather data and analyze how to provide the best care to our patients, which in turn helps us in retaining our patients in the long run. A fire mock drill is conducted every month for all the staff who are trained with what they are supposed to do. Each department has a designated fire marshal who will be the leader. Fireman is present round the clock. Twelve buses for free medical services to rural areas known as JAWAHAR are also handled by this department, and 16 vehicles for pick-up services for nurses, managers, etc. There are 18 elevators present in all the buildings which are serviced, and maintenance is carried out by this department.

Central Sterile Supply Department:

The layout of the department is there is a single entry for dirty linen/ instruments which come into the dirty area that consists of the washing area with ultrasonic machines. Once the instruments are washed, they are moved into the dryer, further into the gas sterilizer for instruments, plasma sterilizer for instruments like scopes, steam sterilizers for tiny equipments. Once all the items are washed, dried, sterilized, they are moved into the packaging area, where different items like medical paper, green linen, non-woven pouch, pill packet are the materials used for packaging. A list is generated daily as per the requirements of each department based on which the items are dispatched through the delivery window situated at the sterile zone. The shelf life of each item depends on the kind of packaging that is used. If the item was not used until the expiry of shelf life, then the item is again sterilized before using it.

The shelf life for each packaged item is as follows:

Green Linen	7 days
Medical Paper	1 month
Non-Woven Pouch	3 months
Pill Pouch (1 side paper, 1 side plastic)	6 months

Each morning before the daily process begins, each machine is tested to see the calibrations, and the results generated indicate the sterilization is up to the mark. Every six months all the equipment go through a maintenance process as well.

Admission & Billing:

The Admission & Billing department has an overall 46 staff. The department has decentralized stations for few departments like Short Stay Services, Accident & Emergency Department, IVF, OPD, and now for Covid facility as well. The centralized admission counter is for ICU, O.T., IPD, and all the TPA settlements. The outstanding bill must be cleared weekly. There is a reminder of the outstanding payment sent to registered mobile numbers. For the convenience of patients and their relatives, there are options for online payment as well. Any refunds are transferred back in 7-10 working days. For TPA settlements, a fixed amount is collected as a deposit which is returned once the bill is cleared.

Intensive Care Unit:

ICU is located on the 2nd floor (20 beds) and 10th floor (23 beds). The facility has six bedded NICU, and 3 bedded PICU as well. All the admissions in the ICU are from Accident & Emergency Department and IPD. Overall, 4 Intensivist are present on both the floors and one dedicated Intensivist for the covid facility. Primary Consultants of the patients, as well as the Intensivists, take 2 rounds every day. The department has a dedicated monitor nurse who updates, looks for the changes in the vitals of the department. 1:1 ratio of nurse to a patient is maintained in both the ICU floors.

Food Service Department:

All the four buildings have one kitchen in common. The staffing in FSD is 115 members who are categorized as cooks, cutters, and cleaners. 10 Dedicated dieticians are present at the department. As a patient is admitted, the dietician meets the patient within the first 24 hours and decides their meal requirements. A weekly menu is also prepared by the dieticians and supervisors. Every day random testing of the food served is carried out in the microbiology department, and the sample is stored for the next 48 hours. All the staff of FSD goes through mandatory health checkups, eye checkups, stool culture every year. The food prepared in the main building is also served in the south building (LG1), which is transported using vans, and since covid, the food is transferred to the covid facility in one-time use container and disposed of in separate garbage bags.

Purchase/ Stores Department:

The purchase and Stores department are together known as the materials department. The stores have sub-stores present in various departments like O.T., IVF, Cath lab, Pharmacy, Engineering where on fixed days, the items are refilled. The indent is placed by each department on the fixed day through the HIS system. Once the indent is generated, a purchase order is placed by the purchasing department. As the material is received, they are checked for their MRP, expiry date, temperature to be stored at, etc. Once done, the GRN

i.e., goods received note, is generated. After which the material is staggered to be distributed to various sub stores and as the ones to be stored in the department. The drug formulary is updated yearly by the committee. Return medications are only taken at night after the indent is placed for the same and only accepted if in good condition. Expired or near expired goods are returned to the company under credit note. Medicines are identified and sorted on the basis of LASA, Cold Chain, High Risk. Narcotics drugs are stored in a double lock, and key storage only dispersed only after the form has the ' 'doctor's signature and ' 'sister's signature and the sign of the stores employee who releases the same. ABC Analysis is the consumption analysis used to understand the number of orders to be placed. The staff count at stores 74 and pharmacy 40.

Short Stay Services:

Short Stay Services is the department where patients with pre-planned operative procedures stay before the same or patients who visit the facility for chemotherapy who may have to stay half a day or day after the procedure. The department has patients for only two days; if more than two are admitted into the ward. So, once a patient registers themselves for a preplanned operative procedure. The details of the same are shared with the SSS unit. The unit then books the O.T. for the patient and the bed at the unit as well. SSS unit has a ward with 15 beds and four single rooms. The staffs at the unit are admission executive – 2, nursing staff – 10 (for three shifts), head of the department – 1, customer service staff – 2, administrative executive – 1. If the patient needs to be kept under observation for more than a day after the operation, they are discharged from the SSS unit and admitted to the ward or ICU.

Engineering & Maintenance:

The electrical, civil, and mechanical needs of the hospitals are handled by this department. Each specialty has a manager under who is the supervisor and the technicians. Any complaints from these domains can be placed on the HIS software specially designed to place engineering-related complaints. Once the complaint is placed, within the first 30 minutes, a point of contact should get in touch with the department and start the process to solve the issue; if not an alert from the same software is sent to the supervisor. After every set interval, if the issue is not at all looked into the alert is escalated to the senior authority. Material is purchased, and the billing is looked after in the department itself. Oxygen liquid plant is set up near the OPD building, and during covid portable liquid oxygen tanks are set up near the covid dedicated building. Oxygen is used in a 60:40 ratio of liquid to gas. 2 transformers and two generators are available for the east and west building. One generator as a backup. Both the south buildings have one transformer and generator each. As laundry requires steam largely, three boilers are set up at the facility, which runs simultaneously. Sewage Treatment Plant is set up at the facility, which treats 2,50,000 liters in a day.

Medical Records Department:

The staffing hierarchy at MRD is assistant director followed by a manager who have 45 staff under him comprising of officers, supervisors, medical transcriptionist - (one who prepares discharge summary), medical coder – (assigning ICD codes and CPT 4 for surgeries which helps convert data into a numerical format for statistic purpose), clerks and attendants. The file is received in the MRD from the nursing department after the day of discharge. The clerk checks the file for any missing information; if found, it is sent back to the department to be filled again. Once the file is complete, then the files are sent to be scanned and uploaded into the system, which has been outsourced. Uploaded files are then moved forward for quality checks, and once cleared by the clerks, then it is available for consultants to view from the E-

MRD. If an old patient returns to the hospital, the file is retrieved from the storage and brought to the nursing station, and once discharged, the same process is followed as above. As per BMC regulations, the details of the expired patients are uploaded into the corporate system with 21 days of death. The files from the covid facility go through U.V. sterilization before being brought to MRD. Retention periods are followed as per the MCI regulations.

Laundry:

Linen from each floor is received through the chute system. Each bag is named with the ward number, and the quantity of the clothes received are recorded. The number of linens received is the same that needs to be sent back as well. (This system only applies to the ward) The linen received from O.T. is first put in the machine and, at the end of the process is sorted (to avoid contamination). Five washers in total are present in the laundry 2 of 12 kg capacity, 2 of 45 kg capacity, and 1 of 30 kg capacity. 4 dryers of 170-pound, 1 of 100-pound, two dryers of 100 kg & 95 kg capacity are also present. A Flatwork Iron machine, which can dry, press, and fold 20 sheets per minute, is used for bedsheets. Five steam press machines are available for pants and gowns. As mentioned above, the quantity received is the same which is filled into the trolleys and sent back to the wards by the laundry attendants. The linen for O.T. is sent to CSSD and from thereafter sterilization to O.T. Two tailor is present at the department for any minimal repair work. Every week linen that is beyond repair are collected to be discarded. All 'uniform's washing, drying, and pressing is handled by laundry. The dispatch linen area is where the staff must come to collect the uniform between the timings 6.30 am to 8 am and 1.30 pm to 4.30 pm.

Housekeeping:

The total count of housekeeping staff is 400, which are primarily divided as sanitation staff and patient need staff, meaning serving food, coffee, transportation, etc. The morning shift has around 250 staff, the afternoon shift sees 100 staff, and the evening shift has 80 to 90 staff. Everyday waste is collected from all the departments at 8 am, 3 pm, 8 pm and 11 pm. The biomedical waste is also correctly segregated and stored at the west block facility. The vendor suggested by the government is the one that has been outsourced for disposal of the waste. Liquid waste is also stored in huge containers; once filled the vendor is informed to come to collect the waste. Every 5 years the contract is renewed, and every detail like the weight of waste generated etc., is taken into consideration during this process. Daily cleaning reports are updated into the software by the supervisors.

Artificial Kidney Dialysis Department:

AKD department conducts around 1500 dialysis every month. The facility has 27 dialysis machines, of which 14 are in the department, two are on standby, 5 in ICU, and six are at the dedicated covid facility. At present, 110 regular patients visit the AKD department for the hemodialysis procedure. On average majority of the patients visit the department thrice a week, and a very few numbers of patients twice a week (patients above 75 years). Once the patient visits the consultant, the consultant decides the number of cycles and the treatment plan, after which the patient is counselled at the AKD and then started on their treatment. For a procedure to be conducted for IPD patients, a prescription is compulsory before the procedure begins. AKD has four shifts of dialysis in a day, starting from 7 am to 10.30 pm. A weekly schedule is prepared for the patient appointment every Thursday by keeping the 'patient's convenience and availability of a bed in mind. Hemodialysis and Plasma Perfusion is the procedure taking place in the department. IPD patients are also brought in their bed to AKD for their procedure; the exception is only for ICU patients. The staff works in two shifts,

and the staffing is as follows: Technicians – 21 (8 or 9 in each shift) as 1 or 2 may be required in ICU or covid facility as per requirement), Nursing Staff – 14 (5 to 6 each shift, one may be required at the covid facility as per requirement), Ward Clerk – 1, Housekeeping Staff -2. The *patients are given an appointment time period to be present at the facility, and they are started on their procedure on a first come, first serve basis. The patient files are maintained in the department itself, and every three months, the old records are handed over to the MRD. The head of department/ senior consultant takes around every day, whereas the junior consultants come as per their ' 'patient's dialysis turn. The dietician helps the patient understand how to maintain their diet regularly as well.

INTRODUCTION

Rationale:

On an average, a kidney failure patient spends 3-4 hours thrice a week at a dialysis center. As the patient pays a significant portion of their time at the dialysis unit receiving the lifesaving treatment, it is essential to understand the patient's experiences at the dialysis center. This study helps us to gather data and analyze how to provide the best care to our patients, which in turn helps us in retaining our patients in the long run.

Research Question:

Identifying the factors to help improve patient experience in the dialysis department at P. D. Hinduja Hospital.

Objective:

General Objective

Improving patient experience of dialysis treatment for our patients.

Specific Objective:

- To conduct a patient satisfaction survey and understand the patient perspective of the care provided to them.
- To observe and analyze the waiting/ turnaround time and detect ways to reduce the same.

- To collect data on the payment history of patients and uncover ideas to streamline the process.

METHODS & MATERIALS

Research Design:

The research design used for this project is a descriptive study. This project gives a detailed insight into the responses from patients on the satisfaction survey, findings of the waiting time and turnaround time study, along with recommendations on improving the billing process.

Sample Size:

- In the Patient Satisfaction Survey conducted, 85 patients on dialysis took part in the survey out of 112 patients, as some patients were extremely unwell or 'didn't consent to the survey.
- The sample size for the time and motion study is 247, where patients from various shifts have been included as samples, where the individual samples may be repeated based on the shifts used in the study.
- The sample size used for the data collection and segregation of payment details from existing patients is 101.

Sampling Technique:

The sampling technique used for all three studies is simple random sampling.

Mode of Data Collection:

A face-to-face interview using a questionnaire was conducted for the patient satisfaction survey. The data collection for waiting time and turnaround time study was collected through observation by being present in the department during various shifts in order for the data to be as precise as possible. The data collection and segregation of payment details was conducted using the documentation and patient records maintained by the department in the form of individual patient files.

Analysis used for the collected Data:

A combination of both quantitative and qualitative analysis is used to carry out the studies. Tools like questionnaires are used to collect the data in descriptive format from the samples which is then converted to numerical form to analyze the information. The tool used is Excel to analyze the data for all the three studies conducted.

DATA COMPILATION

[Patient Satisfaction Survey](#)

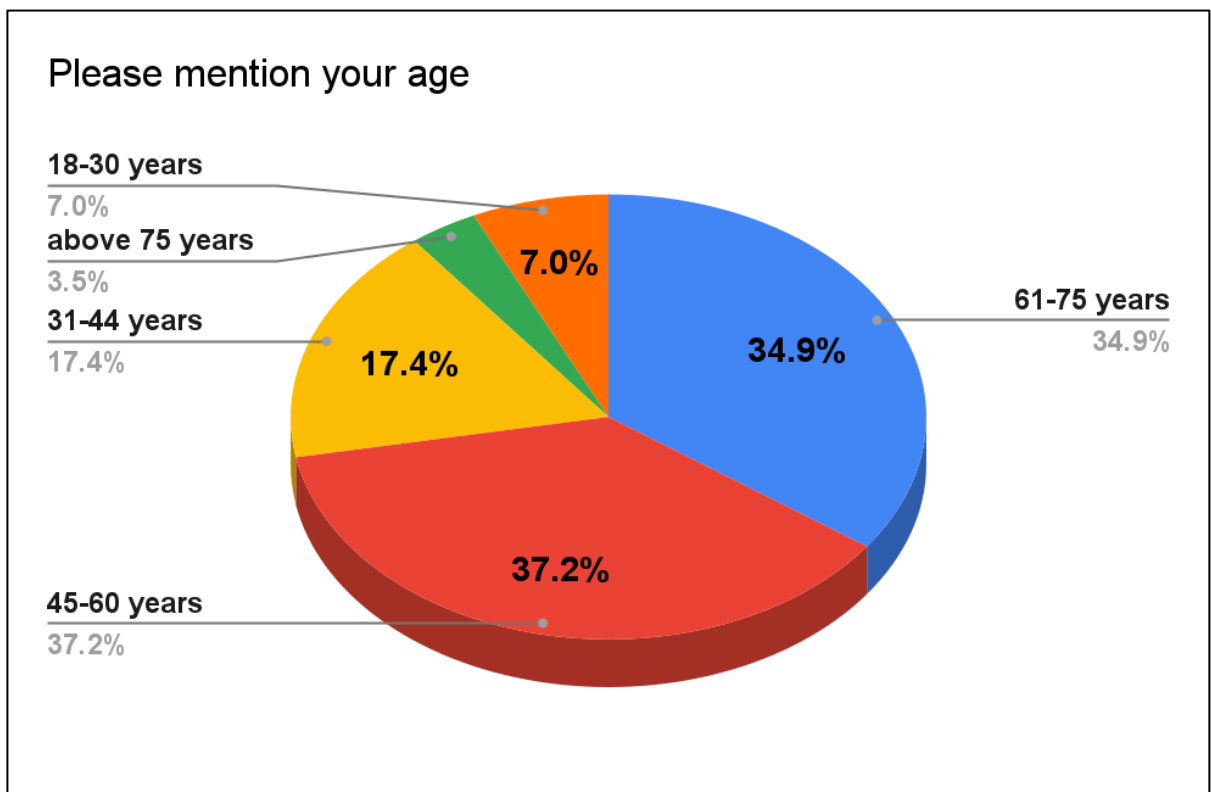
[Waiting Time and Turn Around Time Study](#)

[Data Collection & Segregation of Payment History](#)

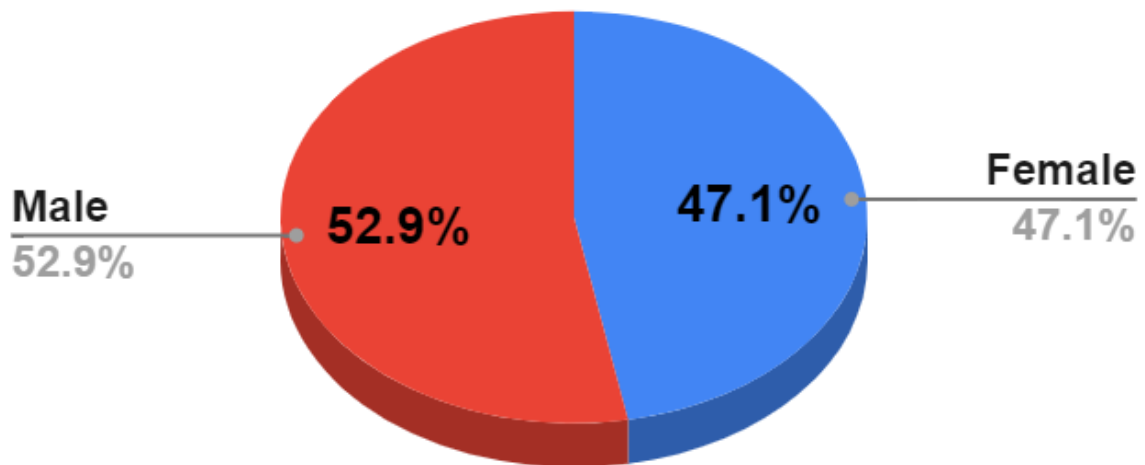
DATA ANALYSIS & INTERPRETATION

Patient Satisfaction Survey:

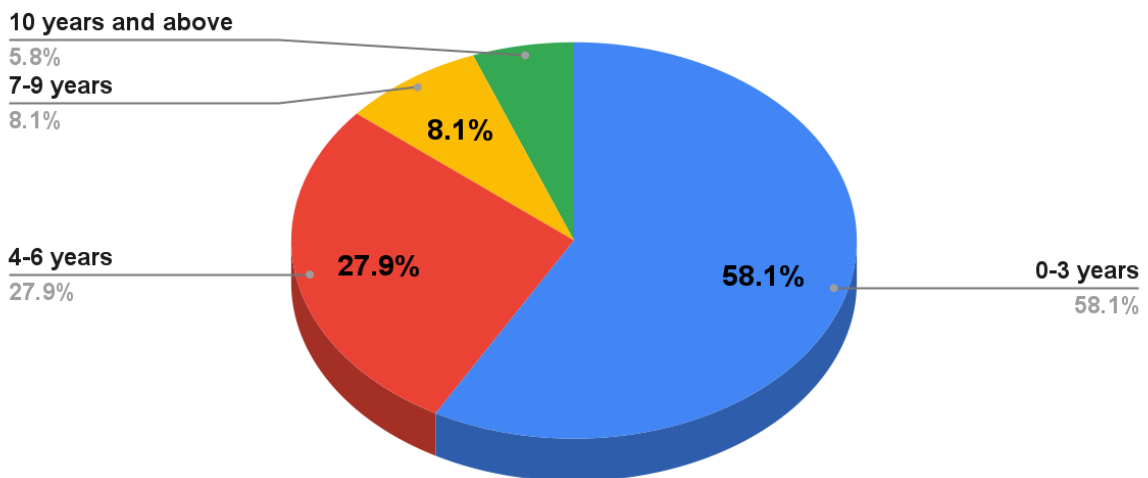
The Patient Satisfaction Survey conducted among 85 dialysis patients gathered the Data which has been presented in the pie chart/ bar graph below.



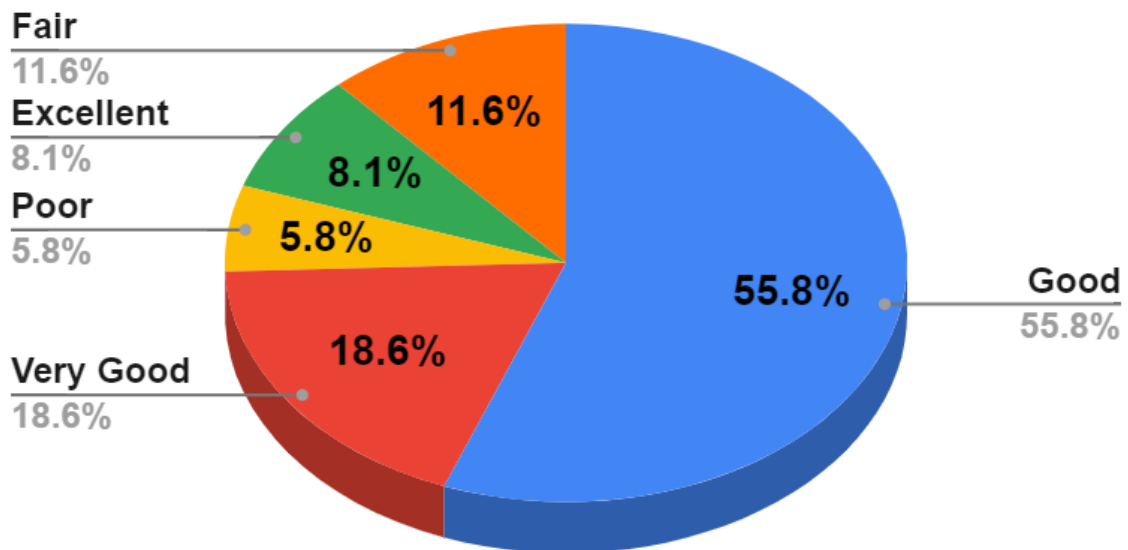
Please mention your gender



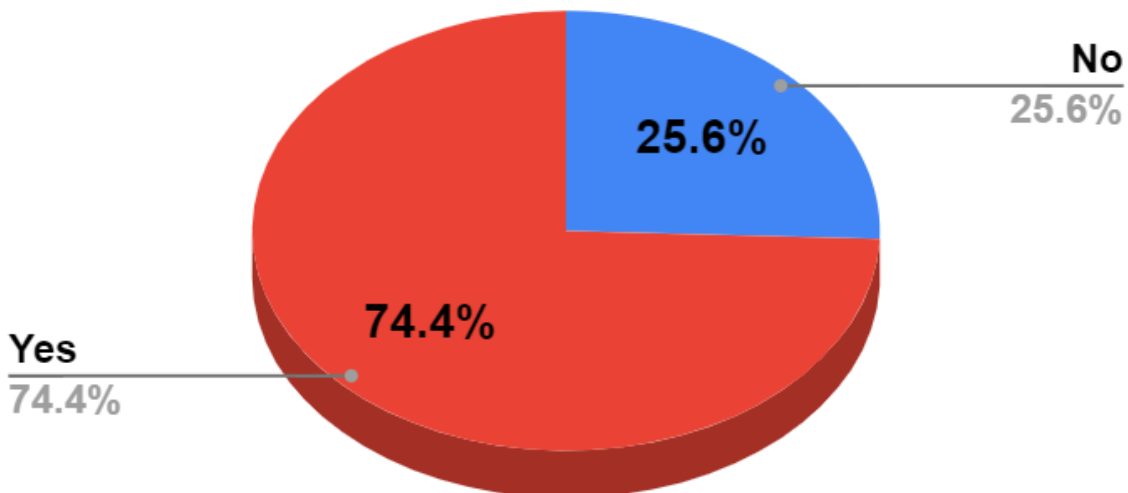
How long have you been on dialysis overall?



In general, how do you rate your overall health over the past 6 months?



Count of When you started your dialysis, were you properly counselled?



Please mention your educational background

Uneducated

7.0%

Post

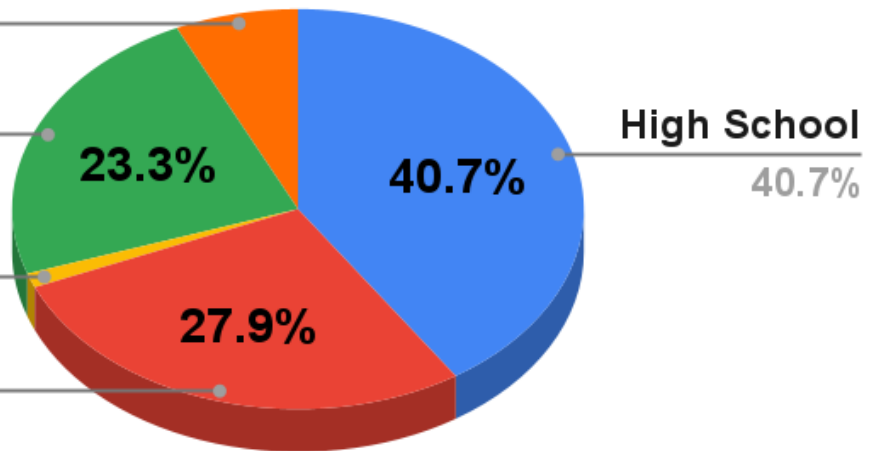
23.3%

Diploma

1.2%

Graduate

27.9%



How long have you been on dialysis overall?

10 years and above

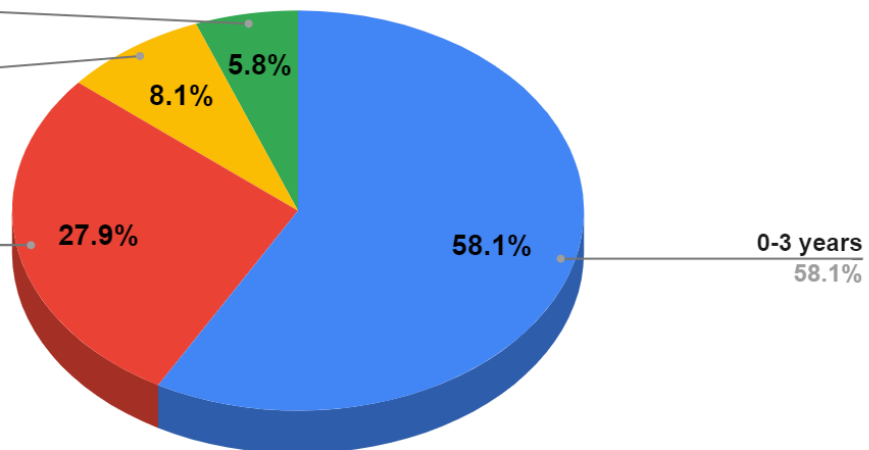
5.8%

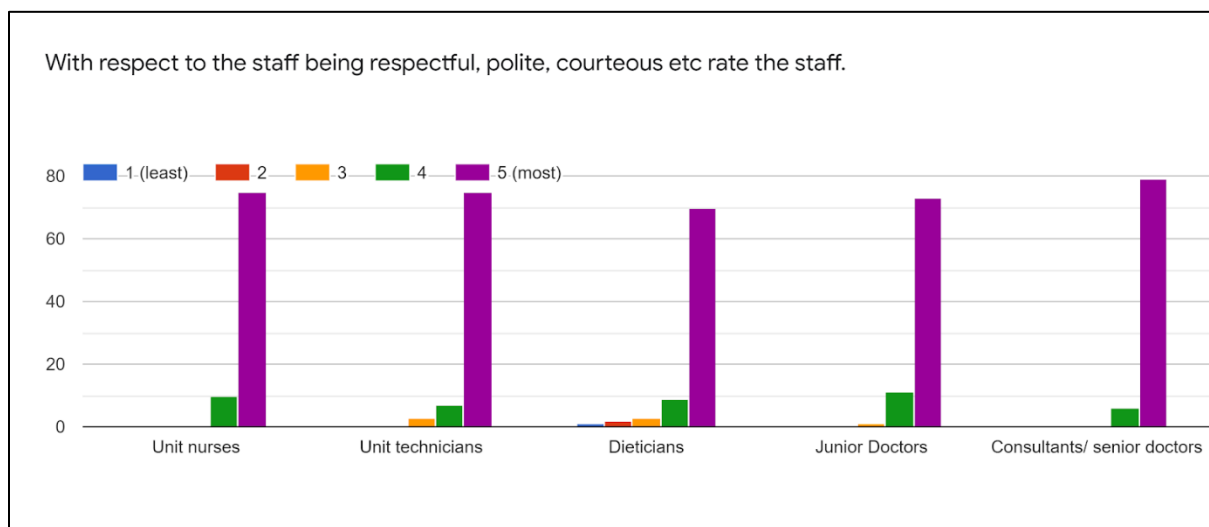
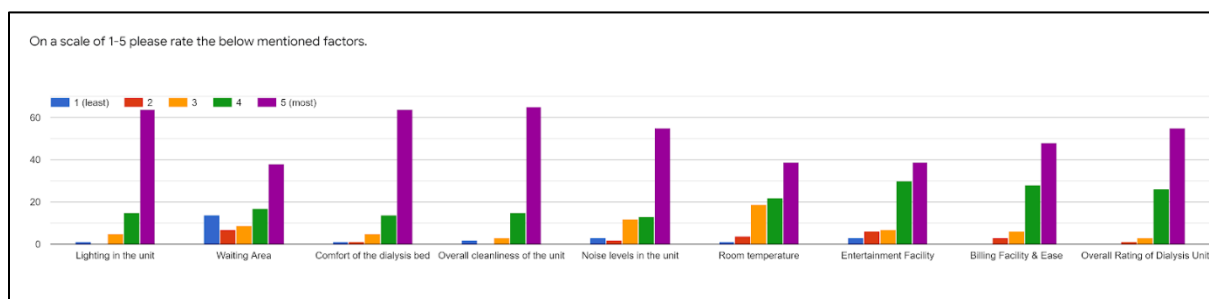
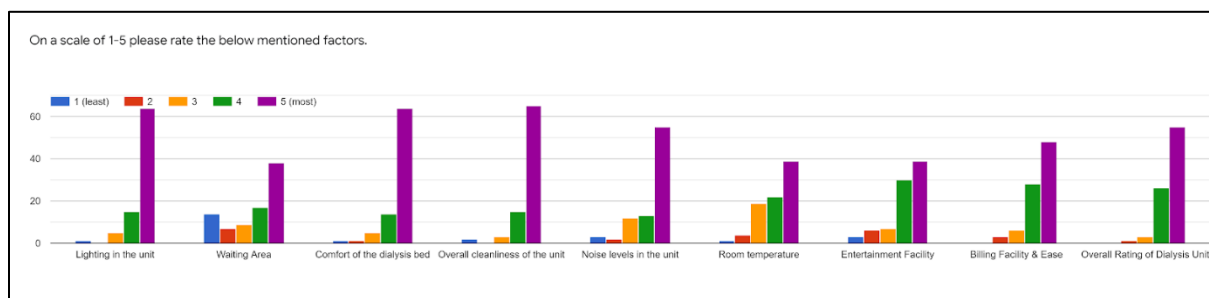
7-9 years

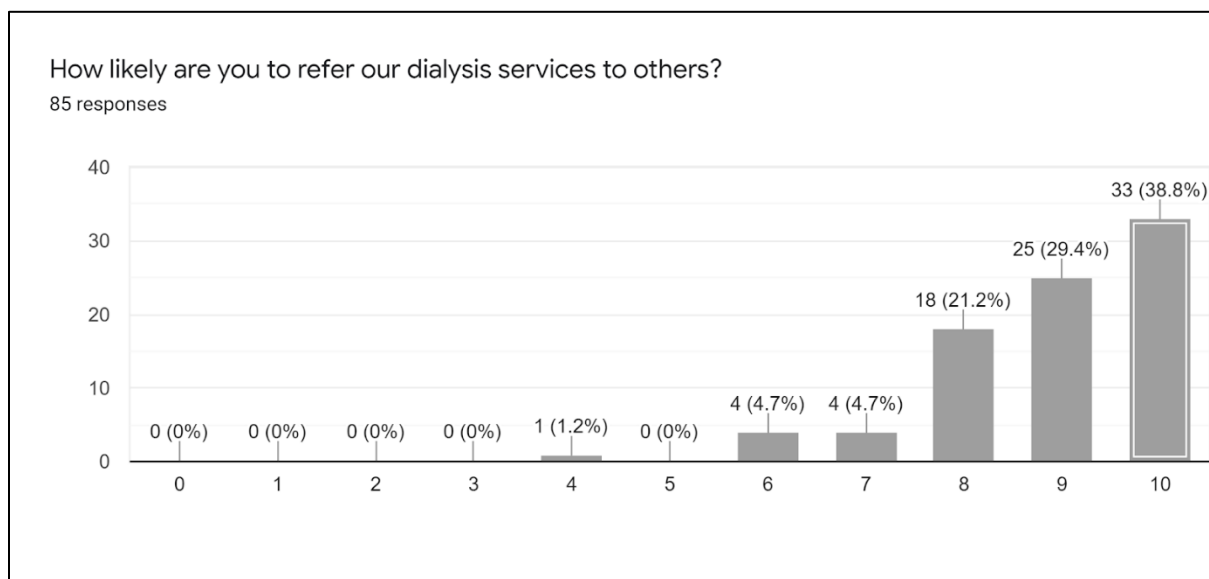
8.1%

4-6 years

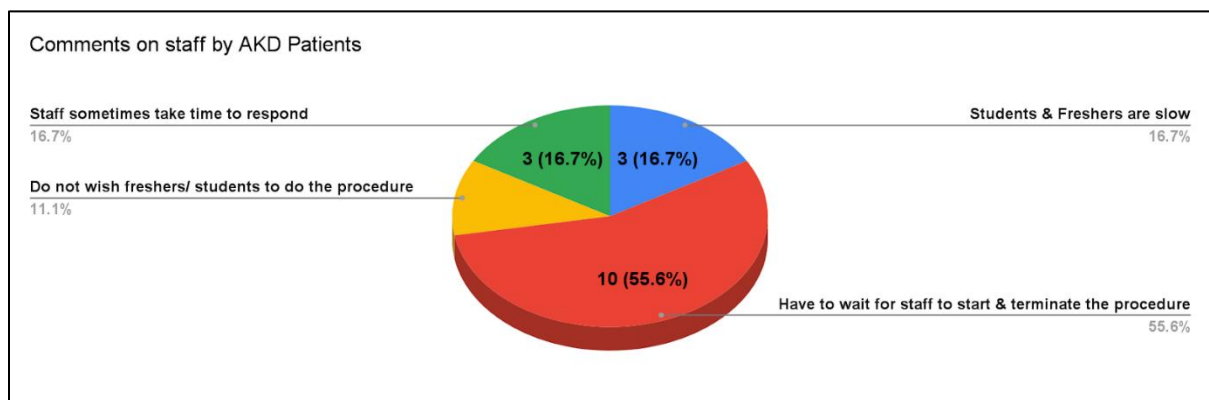
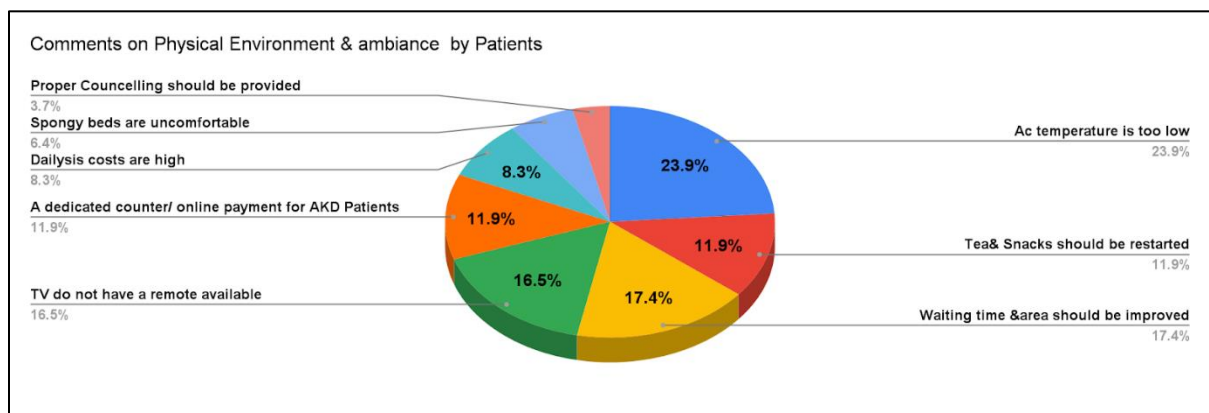
27.9%







(The majority of the participants who rated between 8 and 9 have stated the reason being the cost of the dialysis procedure which 'isn't affordable to a middle-class patient according to them.)

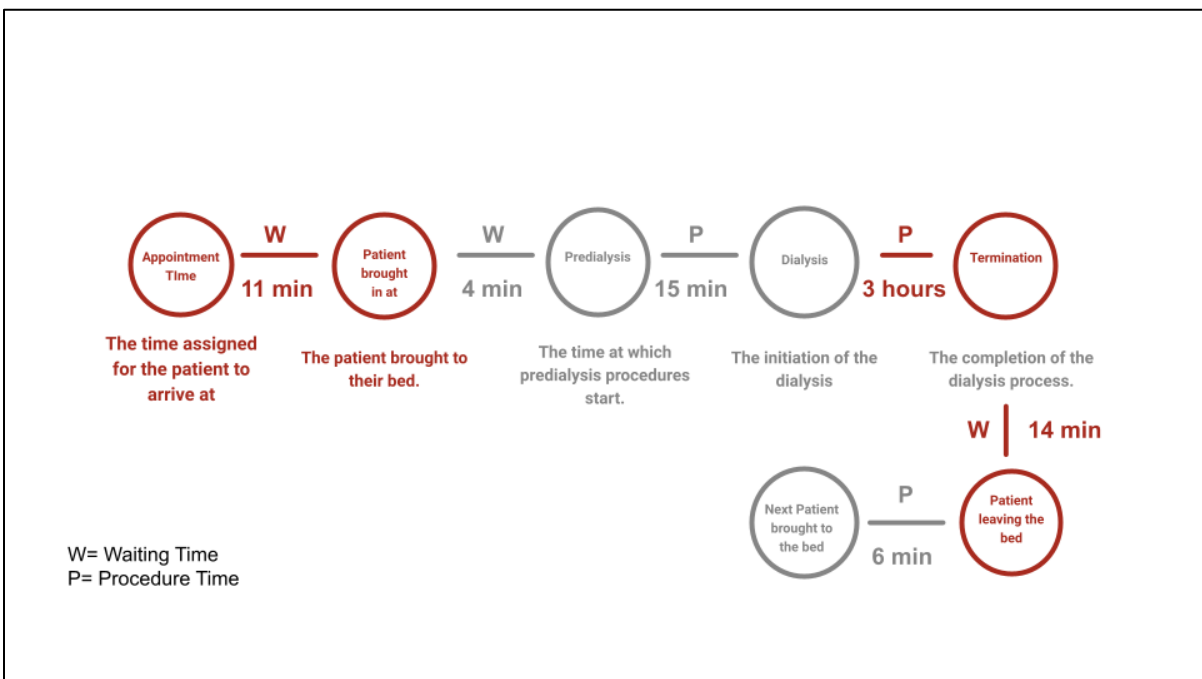


The overall satisfaction rating for the patient satisfaction survey was calculated by taking the weighted average of physical ambience and weighted average of staff into consideration. Weighted Average of Physical Ambience is 4.4 & Weighted Average of Staff 4.8. Hence the overall weighted average for AKD department is 4.6.

Waiting Time & Turn Around Time Study:

After the compilation of the collected by observing the shifts of various dialysis batches, the interpretation was reached upon. The study was conducted by observing each patient from the time they reach the department until they leave the bed. The particulars for which the time was noted are as follows: a) Patient arriving during their appointed time. If the patient arrives once their appointment time has passed, their waiting time until they are brought inside will not be considered. b) Patients brought inside the department, where their predialysis weight is checked and then brought to their beds. c) The start of predialysis procedure like checking blood pressure, noting the vitals in the patient file, accessing the line to start dialysis. d) The actual commencement of the dialysis procedure. e) The termination of the dialysis procedure. f) The time when the patient left the bed.

By noting these timings and compiling the data, I was able to identify the idle time between each step and the turnaround time it took to start the next patient. The limitation would be how the data for all the four shifts of a single day could be captured all at once.



The above flow chart explains that the average waiting time between the patient shows for their appointment, and they are brought inside to their bed is 11 minutes (**Idle Time 1**) and the waiting time to start the predialysis procedure after they are on their bed is 04 minutes, (**Idle Time 2**) making the average total waiting time before the start of procedure 14 minutes. The procedure time it takes between the predialysis and starting the actual dialysis procedure is 15 minutes (**Procedure Initiation Time**). The actual dialysis goes on for 3 hours. Once the dialysis procedure is completed, the average time taken for the patient to leave the bed along with the termination process is 15 minutes (**Termination Procedure**). The turnaround time average which means starting the next patient after the previous patient leaves the bed, is 06 minutes (**Turnaround Time**).

So, the study conducted here concludes that the average waiting time before the starting of the procedure is 14 minutes. The time to get the predialysis work done is 15 minutes, and the patient leaves the bed after 15 minutes; once the dialysis cycle finishes and the start of the next shift patient in another 6 minutes.

The outliers acceptable in the department as per the set policy are a minimum of 5 % and not more than 10%. The study conducted during this project shows the outliers to be as follows during each step:

Outlier Particular	Percentage
Idle Time 1	34%
Idle Time 2	33%
Predialysis Procedure Time	35%
Termination Procedure	31%
Turnaround Time	32%

So, the overall outlier percentage is 33%.

Some of the causes for the rise in the waiting time in between every step that was observed during the study was:

The first batch of dialysis to be conducted on time is very critical to make sure the next three batches can begin on time which means a decrease in waiting time for the patients. If there is a delay even due to a couple of patients, it creates a domino effect for the patients in the further batches increasing the waiting time. The study shows that the first batch of patients

does not have a specific appointment time. The batch starts from 7 am in the morning and patients are brought inside on a first come first serve basis. All the patients are on their dialysis beds by 8.30 am. For the next two batches the 14 patients are divided into 3 groups and give an appointment time range of 30 minutes, to understand it better:

Batch Segregation	Batch 2 Appointment Time Range	Batch 3 Appointment Time Range
First 5 patients	10:15 am to 10:45 am	1:45 pm to 2:15 pm
Next 5 patients	10:45am to 11:15 am	2:15 pm to 2:45 pm
Last 4 patients	11:15 am to 11:45am	2:45 pm to 3:15 pm

Since the first batch does not have a set timing, it is not necessary that the first five patients may show up the first half an hour which means the waiting time for the first five from the next batch may increase even when they are on time and the same for the next two groups as well.

Once the dialysis cycle has been completed, many times patients may feel dizzy, have low blood pressure, nausea which means they are to rest for some time before leaving the bed; this can hold up the bed for the next patient, increasing the turnaround time.

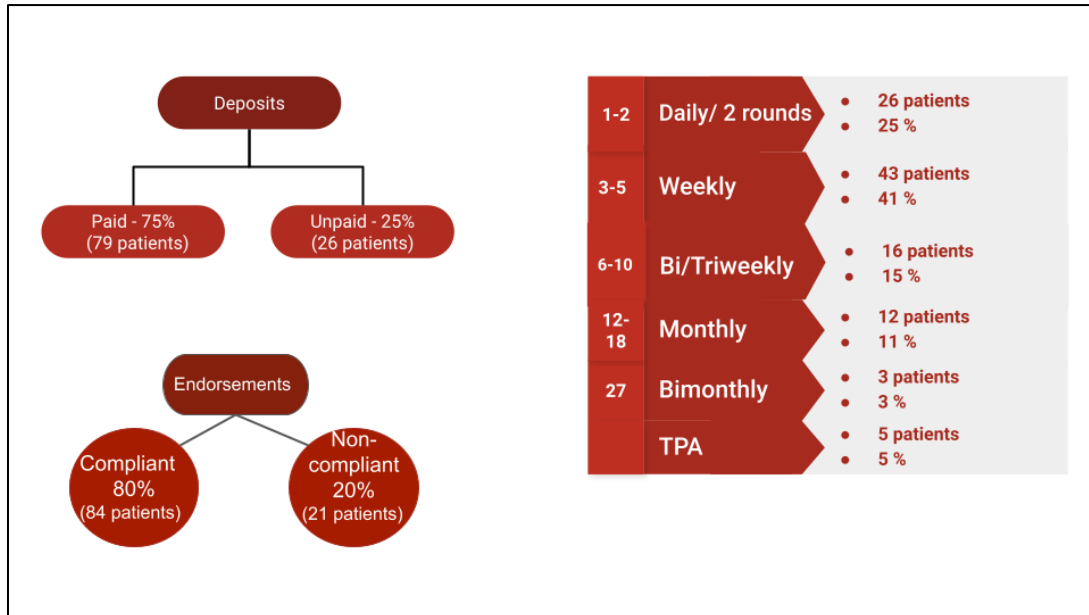
Sometimes nursing staff may cater to other patients, so even when a bed is vacant because there is no nursing staff available to change the linen, the patient must wait until sheets are changed, leading to increased waiting time.

The manual documentation of maintaining various registers with duty register, voucher filing, indent register, individual patient record file, laundry/CSSD filing, etc., also takes up a considerable amount of time.

It was also observed that some of the patients are chronic latecomers, this also leads to the increase in waiting time for the following patients.

Data Collection & Segregation of Payment Frequency

This part of the study included segregating the patients who have and haven't deposits. Tracking the payment frequency behaviors among the patients and examining the compliance of the daily endorsements. All this information was verified from the patient records maintained in the department. The inference from the study was as follows:



75% of the patients have paid the deposits and 80% of the ' 'patient's daily endorsements were compliant up to Data of the study. The highest payment frequency is weekly by 41%, followed by 25% of patients who pay daily and 15% who pay every two, and 11% who pay monthly. The remaining 8% comprises patients who pay every two months and who are covered by TPA.

RECOMMENDATIONS TO IMPROVE PATIENT SATISFACTION

- Minimal key remote (hospitality remote) for each bed to be attached to the bedside using a coiled cable. This will help in decreasing the misplacement of the remotes.
- Cushions can be used for the existing plastic chairs in the waiting area, which has been deemed uncomfortable by the patients during the survey to make the wait for the relatives comfortable. Mounting benches parallel to the walls increases the seating capacity.
- Training for freshers and students on communicating with the patients and building a rapport with them, to ensure that patients start trusting the new staff.

- Call bell to be provided (especially to bed no. 6,7,8,9) as these are the corner beds, and sometimes if the curtains are drawn, staff 'won't be able to hear the patients unless they are nearby.

RECOMMENDATIONS TO IMPROVE WAITING PERIOD IN AKD DEPARTMENT

- The first batch of patients should be divided into two halves, and the first seven patients to be given an appointment time of 7-7.30 am and the next half between 7.45 to 8.15 am. This helps with the termination of the first half by the time the next batch shows up for their appointment, reducing the waiting time.
- The list put on the notice board every week can also mention the appointment timings for each group, reminding the patients of the time every time they look at it.
- Portable Recline chairs to be kept handy, so patients who feel dizzy or tired and want to rest after the procedure can do the same on the chairs, decreasing the turnaround time for the bed.
- To decrease the turnaround time, if the nursing staff is not available, housekeeping staff, students, technicians, anyone who is free could make the bed start the next patient.
- Using NIBP attached to the dialysis machine and documenting all the readings at the end saving time.
- Regular team-building exercises, workshops for the technician and nursing staff together to build a positive team attitude.
- Indent request management can be segregated, i.e., machine-related indents can be managed by technical staff and patient-related indent management by nursing staff.

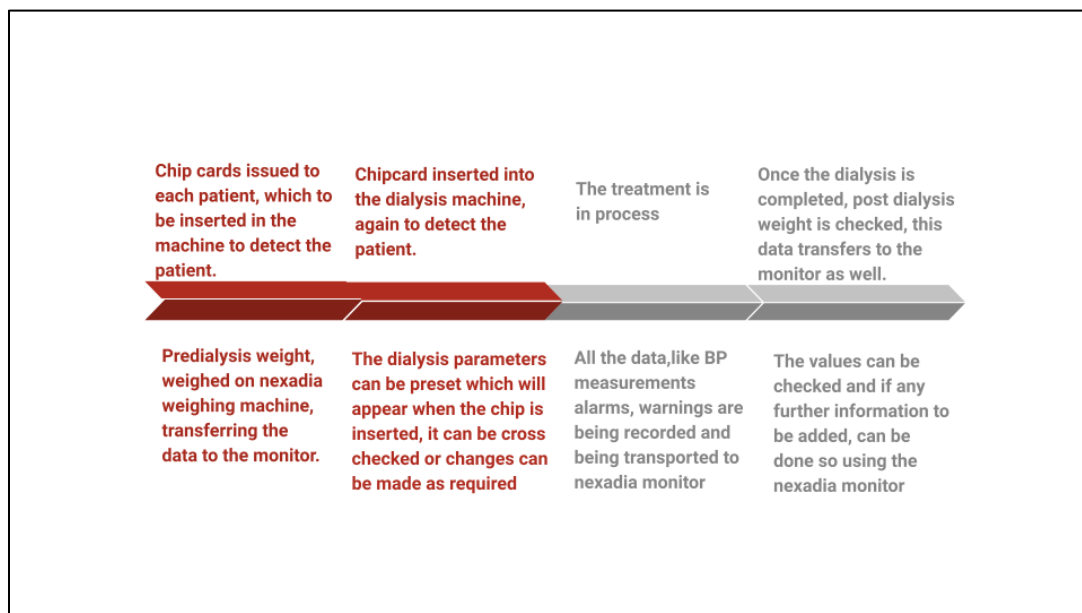
RECOMMENDATION FOR VOUCHER MANAGEMENT & SYSTEMATIC PAYMENTS:

- Currently, since vouchers are manually checked by nursing staff to avoid missing out on filling voucher details, while the patients come inside to inform their arrival, the technician notes their number and are then taken in by first come, first in basis, so the one who marks their appointment can ask to check for a voucher of that particular day. In this way, before the patient is brought to bed, there is double-checking that takes place once during the arrival and once by nursing staff entering the voucher details, which will minimize the lack of voucher details documented before a dialysis session.

- To make the voucher management system system-based, a barcode scanner/ reader can be set up at the nursing counter before entering. The Data is decoded by the scanner into an excel sheet. Further meetings for nexadia software can be explored if the excel sheet with the voucher data can be integrated into the nexadia monitor.

DATA MANAGEMENT SOLUTION - NEXADIA BY B BRAUN

The study helped us understand the administrative tasks in the department are largely person-dependent as well. Hence, it affects the providing the best care to the patients in terms of increased waiting time, waiting in between procedures, etc. A one-stop solution to this might be trying to convert the documentation process, administrative data collection to a system-based process as much as possible, which will increase the time for the staff to dedicate towards patient care more efficiently. One such solution is the Nexadia Data Management System. This software is a product of B Braun Company, the dialysis machines at the facility are from the same company. Upon initial research, it seemed to provide us with solutions for our various needs. Hence a meeting was set up by me with the company and the upper management at the hospital. During the initial meeting, the sales executive of B Braun explained and gave a brief idea about the software and what all objectives can be achieved using the same. The same has been explained below:



Research Question:

Data Validation of three nursing Quality Indicators to identify the compliance rate.

Objective:

- To find the compliance rate of the indicators, helping us assess further what steps to be taken.
- To compare if the data received from the department level matches the study results obtained by me during the study, helping to confirm the legitimacy of the data.
- To identify if the indicators are fulfilled as per the NABH Standard requirements.

METHODS & MATERIALS**Research Design:**

The research design used for this project is a quantitative study. This project helps us identify the exact compliance rates for each indicator, which can be used to conduct descriptive analysis based on the findings.

Sample Size:

- For the Initial Care Initiation Indicator and Initiation of Care Plan Indicator, 120 'patient's data were used, which was approximately 10% of the In- Patient Admissions in the first six months of 2021.
- For the Handover Process Compliance Indicator, 76 shifts were used as sample size as per the 10% requirement.

Sampling Technique:

The sampling technique used for all the first two indicators are stratified random sampling, as patients ranging from discharge period of March to June were identified for the study. The handoff process compliance indicator used a random sampling technique.

Mode of Data Collection:

The Data for Initial Care Initiation Indicator and Initiation of Care Plan Indicator were collected from E- MRD and analyzed in excel sheet whereas, the handoff process compliance indicator was collected from the E- MRD and cross checked for compliance with the communication book at each floor of In- Patient Department to check for compliance. The analysis for this indicator was also carried out in excel format.

DATA COMPILATION:

Data Validation for 3 Indicators (Nursing)

DATA ANALYSIS & INTERPRETATION:

Indicator: Initial Nursing Assessment

Requirement: The initial assessment is to be completed within 30 minutes of arrival into the department. To see if this indicator is compliant or not, a stratified random sample of 120 patients ranging from March to June (discharge month) was considered.

The finding of the study is as follow:

Initial assessment within 30 mins	180
Initial assessment after 30 mins	0
Total	180

Compliance for Initial Assessment Indicator: 100%

Indicator: Initiation of Care Plan

Requirement: The initiation of the first care plan should be done within the first 24 hours after admission. To see if this indicator is compliant or not a stratified random sample of 120 patients ranging from March to June (discharge month) was considered.

The finding of the study is as follow:

Initial Care Plan within 24 hours	180
Initial Care Plan after 24 hours	0
Total	180

Compliance for Initiation of Care Plan Indicator: 100%

Indicator: Appropriate Handover Process

Requirement: The handover signatures in the ISBAR tool should match the communication book maintained in each floor of the IPD Sections. To see if this indicator is compliant or not, a random sample of 76 shift handovers was considered.

The finding of the study is as follow:

Handoff Process Communication Book	76
Handoff Process ISBAR Tool	76
Total	76

Compliance for Handover Process Indicator: 100%

LEARNINGS FROM BOTH THE PROJECTS:

- According to me, I believe with a properly managed patient database collection and storage system which is system based there can be significant change in the waiting time and turnaround time at the AKD department.
- Also, the staff could have team building exercises organized by HR which help the staff to work harmoniously to achieve the goal of quality care to patient and top-notch patient experience during the visits.
- The data validation study did help us know the compliance rate, which is up to mark, but there can be staff development classes ensuring the data is present in all patient records, as many data could not be considered for this study due to the information being incomplete.

ANNEXURE

Appointment Time	Patients showing up earlier than the appointed time													
Waiting Time	waiting time considered 0 as pts. come in late													
Outliers	Waiting period of more than the average value													
Date & (Shift)	Bed No.	Patient Initials	Access Point	Appointment Time/ Pt. coming in	Pt. bought in	Idle Time 1 (Pt. bought in-Appointment Time)	Pre dialysis started at	Idle Time 2 (Predialysis starting time-Pt. bought in)	Dialysis started at	Procedure Initiation Time (Dialysis starting-Procedure starting)	Total Waiting Time	Dialysis Terminated	Pt. Left	Time taken for pt. to leave the bed
20/05/21- (2)	1	BB	CVC	10:42:00 AM	10:45:00 AM	0:03:00	10:54:00 AM	0:09:00	11:10:00 AM	0:16:00	0:12:00	2:14:00 PM	2:20:00 PM	0:06:00
20/05/21- (2)	2	JD	CVC	10:24:00 AM	10:40:00 AM	0:16:00	10:41:00 AM	0:01:00	11:00:00 AM	0:19:00	0:17:00	2:00:00 PM	2:11:00 PM	0:11:00
20/05/21- (2)	3	JV	CVC	11:45:00 AM	12:45:00 PM	1:00:00	12:48:00 PM	0:03:00	1:05:00 PM	0:17:00	1:03:00	4:10:00 PM	4:23:00 PM	0:13:00
20/05/21- (2)	4	UG	CVC	10:54:00 AM	11:06:00 AM	0:12:00	11:10:00 AM	0:04:00	11:30:00 AM	0:20:00	0:16:00	2:27:00 PM	2:46:00 PM	0:19:00
20/05/21- (2)	5	SarKh	AVF	11:10:00 AM	11:10:00 AM	0:00:00	11:15:00 AM	0:05:00	11:30:00 AM	0:15:00	0:05:00	2:27:00 PM	2:37:00 PM	0:10:00
20/05/21- (2)	7	NiIPat	CVC	11:45:00 AM	12:22:00 PM	0:37:00	12:34:00 PM	0:12:00	12:50:00 PM	0:16:00	0:49:00	3:50:00 PM	3:58:00 PM	0:08:00
20/05/21- (2)	9	DB	CVC	10:35:00 AM	10:43:00 AM	0:08:00	10:45:00 AM	0:02:00	11:10:00 AM	0:25:00	0:10:00	2:10:00 PM	2:21:00 PM	0:11:00
20/05/21- (2)	10	AH	CVC	10:45:00 AM	11:00:00 AM	0:15:00	11:03:00 AM	0:03:00	11:15:00 AM	0:12:00	0:18:00	2:45:00 PM	2:57:00 PM	0:12:00
20/05/21- (2)	11	GV	CVC	11:19:00 AM	11:24:00 AM	0:05:00	11:29:00 AM	0:05:00	11:45:00 AM	0:16:00	0:10:00	2:45:00 PM	3:05:00 PM	0:20:00
20/05/21- (2)	12	AlbB	CVC	10:23:00 AM	10:40:00 AM	0:17:00	10:45:00 AM	0:05:00	11:00:00 AM	0:15:00	0:22:00	2:00:00 PM	2:24:00 PM	0:24:00
20/05/21- (2)	13	GulV	AVF	11:15:00 AM	12:19:00 PM	1:04:00	12:22:00 PM	0:03:00	12:30:00 PM	0:08:00	1:07:00	3:40:00 PM	3:52:00 PM	0:12:00
20/05/21- (2)	14	AKB	AVF	11:30:00 AM	11:00:00 AM	-0:30:00	11:03:00 AM	0:03:00	11:15:00 AM	0:12:00	-0:27:00	3:15:00 PM	3:27:00 PM	0:12:00

Sample Size: 10% of 1161 - Approximately 120				
Sample No.	HH No.	Time Arrival	Initial of Care Plan	QI Compliance (Y/N)
1	1774636	9/2/21 - 8:40 PM	9/2/21 - 9 PM	Y
2	629169	23/2/21 - 6:35 PM	23/2/21 - 7:00 PM	Y
3	1789098	25/2/21 - 6:45 PM	25/2/21 - 7:00 PM	Y
4	1769047	9/3/21 - 2:15 AM	9/3/21 - 3:00 AM	Y
5	1455594	19/2/21 - 6:30 PM	19/2/21 - 6:30 PM	Y
6	1312078	25/2/21 - 8:20 PM	2/3/21 - 5:00 PM	Y
7	1785442	24/2/21 - 10:00 PM	24/2/21 - 10:00 PM	Y
8	1741573	28/2/21 - 2:30 PM	28/2/21 - 3:00 PM	Y
9	1785290	17/3/21 - 12:28 AM	17/3/21 - 12:30 AM	Y
10	1782985	25/2/21 - 5:10 PM	25/2/21 - 5:15 PM	Y
11	1789974	1/3/21 - 4:00 PM	1/3/21 - 5:00 PM	Y
12	87455	26/2/21 - 5:20 PM	26/2/21 - 5:30 PM	Y
13	870375	22/1/21 - 2:45 PM	22/1/21 - 3:00 PM	Y
14	1144037	19/2/21 - 6:20 PM	19/2/21 - 6:40 PM	Y
15	1178586	28/2/21 - 2:35 AM	28/2/21 - 3:00 AM	Y
16	1788666	2/3/21 - 6:00 PM	2/3/21 - 7:00 PM	Y
17	1782736	3/3/21 - 4:00 PM	3/3/21 - 3:35 PM	Y
18	1789188	28/2/21 - 5:30 AM	28/2/21 - 6:00 AM	Y
19	1363410	2/3/21 - 6:45 PM	2/3/21 - 7:30 PM	Y
20	1532209	21/2/21 - 5:45 PM	3/3/21 - 6:00 PM	Y
21	1786346	21/2/21 - 5:00 PM	1/3/21 - 9:30 PM	Y
22	1789599	28/2/21 - 7:10 PM	28/2/21 - 7:15 PM	Y
23	1789441	1/3/21 - 9:00 PM	1/3/21 - 9:30 PM	Y
24	1785121	4/3/21 - 1:00 PM	4/3/21 - 2:30 PM	Y
21	1786346	21/2/21 - 5:00 PM	21/2/21 - 5:30 PM	Y

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
12	KaIM	CVC	10:47:00 AM	10:57:00 AM	0:10:00	11:00:00 AM	0:03:00	11:30:00 AM	0:30:00	0:13:00	2:30:00 PM	2:53:00 PM	0:23:00	0:20:00	
13	GulV	AVF	11:55:00 AM	12:17:00 PM	0:22:00	12:21:00 PM	0:04:00	12:40:00 PM	0:19:00	0:26:00	3:40:00 PM	3:57:00 PM	0:17:00	0:10:00	
14	BB	CVC	10:40:00 AM	10:54:00 AM	0:14:00	10:59:00 AM	0:05:00	11:15:00 AM	0:16:00	0:19:00	2:15:00 PM	2:34:00 PM	0:19:00	0:19:00	
Bed No.	Patient Identification Initials	Access Point	Appointment Time/ Pt. coming in	Pt. bought in	Idle Time 1 (Pt. bought in-Appointment Time)	Pre dialysis started at	Idle Time 2 (Predialysis starting time-Pt. bought in)	Dialysis started at	Procedure Initiation Time (Dialysis starting-Procedure starting)	Waiting Time	Dialysis Terminated			Time taken to start a new pt. (Shift 2 to 3)	
1	VL	AVF	2:21:00 PM	2:54:00 PM	0:33:00	2:58:00 PM	0:04:00	3:15:00 PM	0:17:00	0:37:00	6:15:00 PM			0:01:00	
2	NTh	AVF	1:45:00 PM	2:16:00 PM	0:31:00	2:20:00 PM	0:04:00	2:35:00 PM	0:15:00	0:35:00	5:35:00 PM			0:04:00	
3	PD	AVF	2:36:00 PM	3:20:00 PM	0:44:00	3:27:00 PM	0:07:00	3:35:00 PM	0:08:00	0:51:00	6:35:00 PM			0:09:00	
4	RajM	AVF	2:21:00 PM	2:59:00 PM	0:38:00	3:03:00 PM	0:04:00	3:15:00 PM	0:12:00	0:42:00	6:15:00 PM			0:03:00	
5	AH	CVC	2:33:00 PM	3:00:00 PM	0:27:00	3:06:00 PM	0:06:00	3:30:00 PM	0:24:00	0:33:00	6:30:00 PM			0:02:00	
6	DV	CVC	4:08:00 PM	4:10:00 PM	0:02:00	4:14:00 PM	0:04:00	4:30:00 PM	0:16:00	0:06:00	7:30:00 PM			0:29:00	
7	SS	CVC	3:13:00 PM	3:31:00 PM	0:18:00	3:35:00 PM	0:04:00	3:50:00 PM	0:15:00	0:22:00	6:50:00 PM			0:04:00	
8	PJ	AVF	3:15:00 PM/ 3:39:00 PM	3:48:00 PM	0:00:00	3:51:00 PM	0:03:00	4:00:00 PM	0:09:00	0:00:00	7:00:00 PM			0:03:00	
9	CT	AVF	1:45:00 PM	2:52:00 PM	1:07:00	2:55:00 PM	0:03:00	3:05:00 PM	0:10:00	1:10:00	6:05:00 PM			0:06:00	
10	SunP	AVF	3:19:00 PM	3:43:00 PM	0:24:00	3:50:00 PM	0:07:00	4:00:00 PM	0:10:00	0:31:00	7:00:00 PM			0:04:00	
11	RS	AVF	2:37:00 PM	3:35:00 PM	0:58:00	3:40:00 PM	0:05:00	3:50:00 PM	0:10:00	1:03:00	6:50:00 PM			0:04:00	
12	DilB	AVF	2:30:00 PM	2:55:00 PM	0:25:00	2:58:00 PM	0:03:00	3:10:00 PM	0:12:00	0:28:00	7:10:00 PM			0:02:00	
13	KriM	CVC	4:14:00 PM	4:14:00 PM	0:00:00	4:26:00 PM	0:12:00	4:40:00 PM	0:14:00	0:12:00	6:40:00 PM			0:17:00	
14	SanK	AVF	1:45:00 PM	2:37:00 PM	0:52:00	2:45:00 PM	0:08:00	2:55:00 PM	0:10:00	1:00:00	5:55:00 PM			0:03:00	
					0:11:00		0:04:00		0:15:00	0:16:00			0:14:00	0:06:00	
					Waiting time between pt. bought inside and they show up.		Waiting time between pt. bought to bed and starting the process.		Time taken to get the access (Predialysis)	Total waiting time until starting predialysis			Time taken for pt. to leave the bed	Time taken to start a new pt.	

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