

The image shows a large, modern medical facility with a multi-story building. The building has a mix of grey, blue, and red facades. The text is overlaid on the image.

DR. VASANTRAO PAWAR MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTER

DEPT. OF MEDICINE

ARTIFICIAL KIDNEY DEPT HAEMODIALYSIS UNIT



AUDIT FOR DIALYSIS UNIT
2018 to 2019

BACKGROUND

- ◆ Dr. Vasantrao Pawar medical college started its hemodialysis unit in the year **April 2008**.
- ◆ The Unit is currently equipped with **8 hemodialysis machines** (including 1 HCV Positive Machine and 1 intermediate machine) and 1 reverse osmosis plant (RO systems)
- ◆ Unit has provision of **Emergency dialysis in ICU** with 4 ports for RO connection.
- ◆ Total number of dialysis done till Feb 2019 is **18,072**.

❖ **Intermediate machine:**

For patient diagnosed as AKI/CKD and need to be dialyzed we do HIV, HBsAg, HIV by rapid method (tridot).

Which is not a confirmatory method .

◇ **Negative machine:**

once serostatus is confirmed as negative (by ELISA) pt is dialyzed on negative machine.

❖ **HCV machine:**

exclusively for HCV positive patient



Reverse Osmosis Plant
Capacity: 1500 lit
Providing water 1000 lit/hr

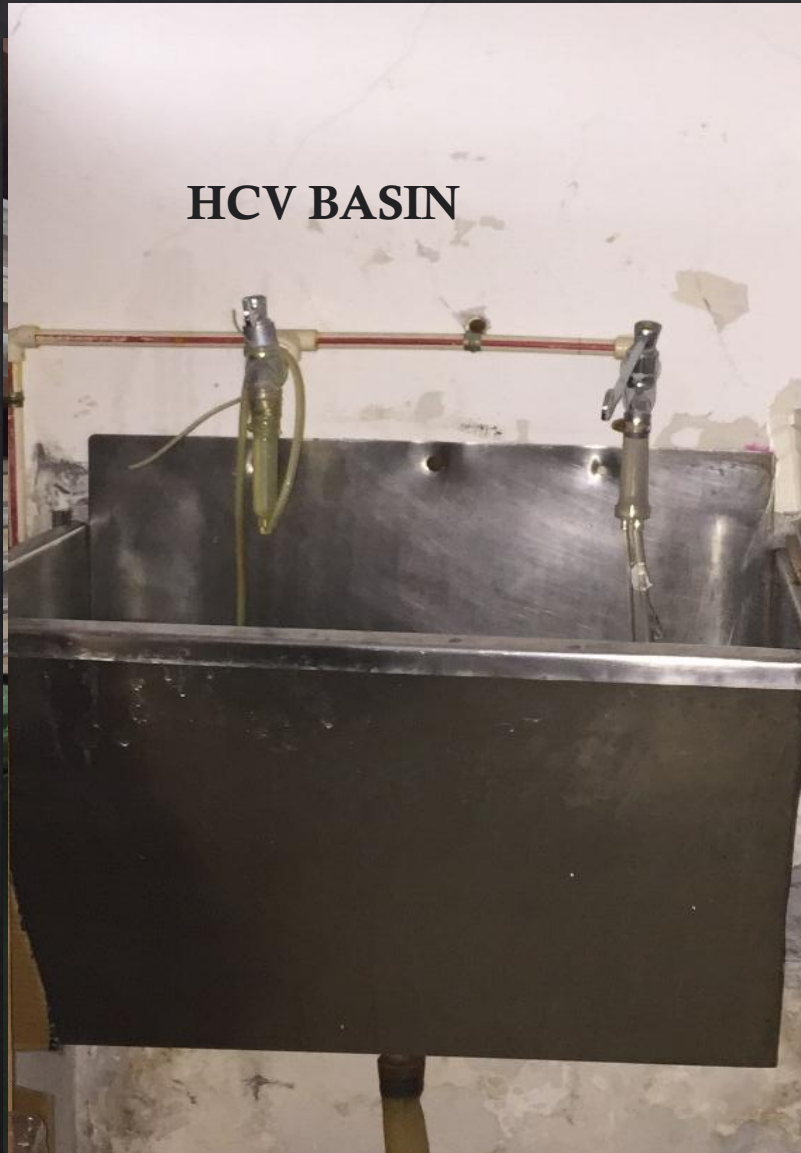
Cardiac monitor

❖ To monitor vitals during dialysis

1. Pulse
2. Blood pressure
3. saturation



HCV BASIN

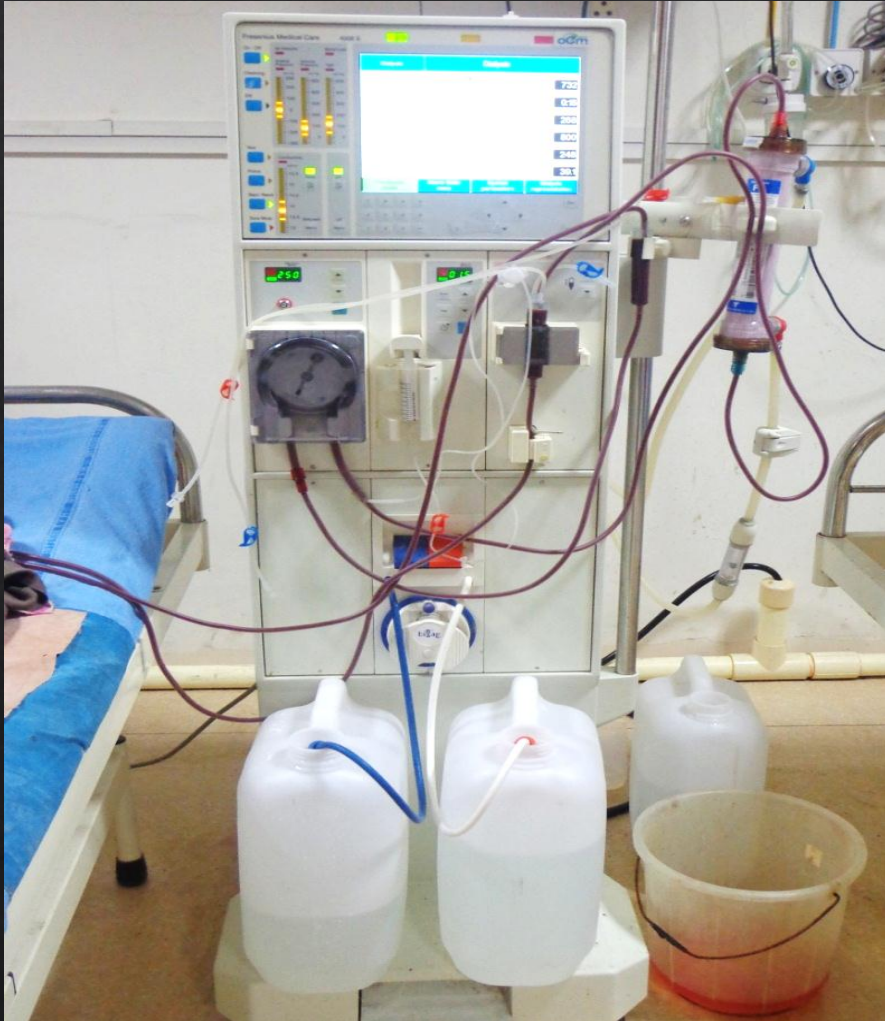


BASIN ROOM







BICARB MIXTURE



4 FRESenius Machines
OCM: Online clearance monitor
4008H/S
4009 HEMODIALYSIS SYSTEM







- ❖ Dialysate flow 300/500/800
- ❖ Blood flow 15-500ml/hr
- ❖ SLED upto 10hrs
- ❖ HDF not possible






































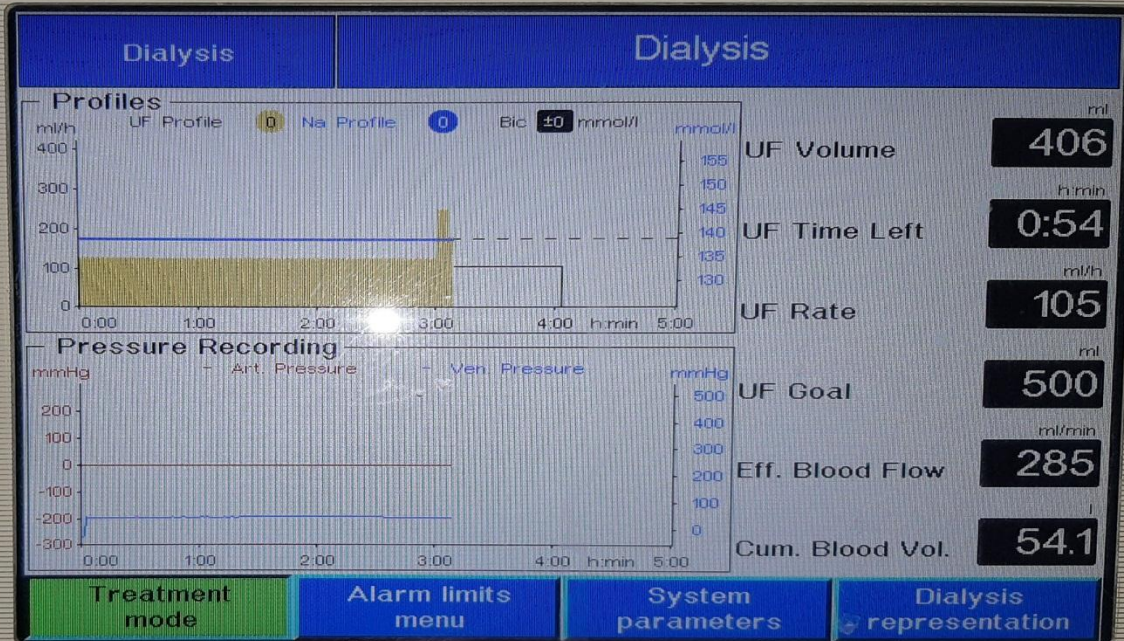
























4008H/S
4009 [display screen]



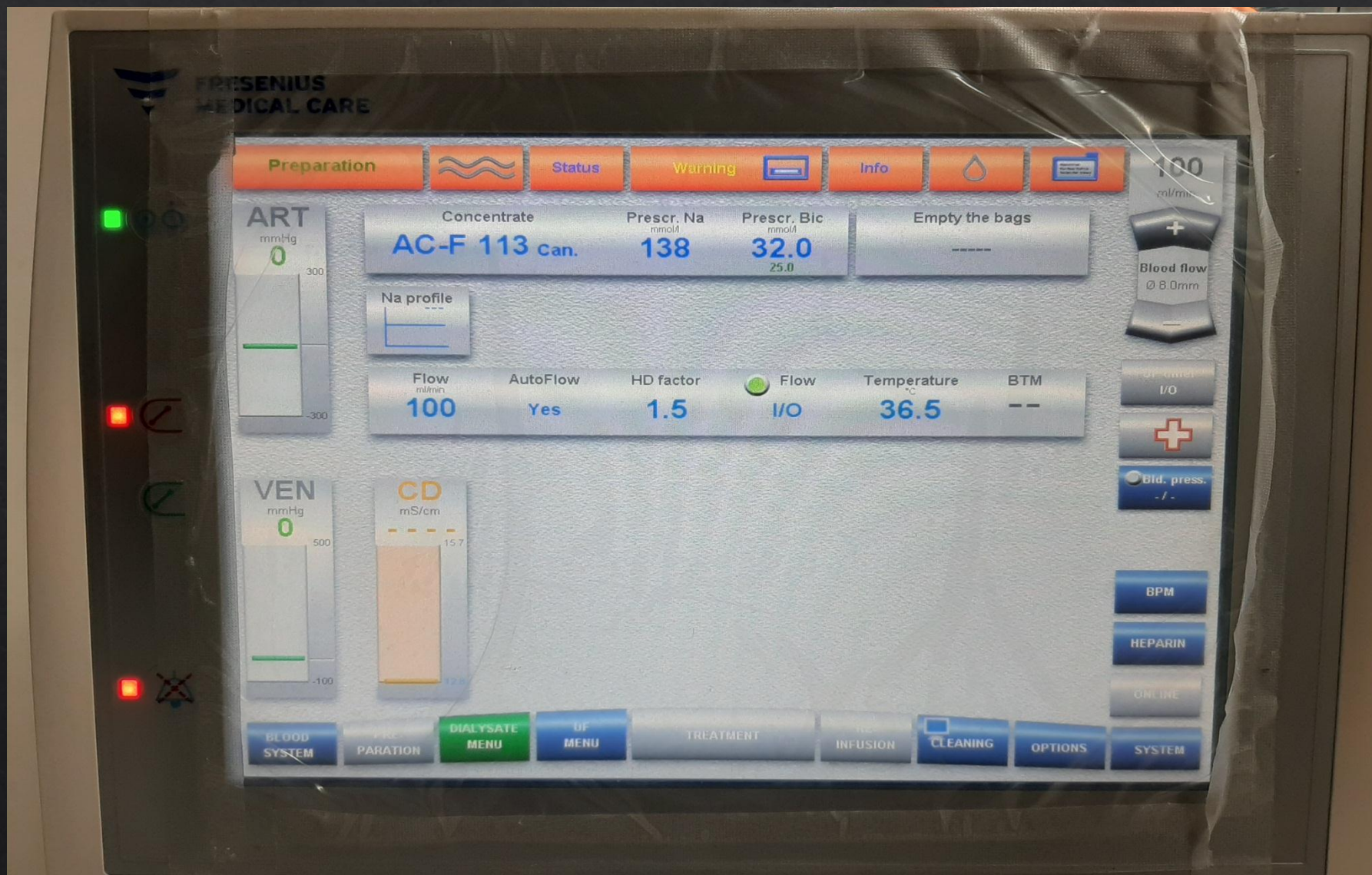
FRESENTIUS 5008/5008S

Additional Features

- ❖ It has 2 pump
 - blood pump
 - substitute pump
- ❖ Emergency button
- ❖ Hybrid therapy (HDF).(CRRT)
- ❖ Dialysate flow (100-1000m/hr)
- ❖ According to blood flow we can adjust dialysates flow
- ❖ SLED can be done for max 24 hr
- ❖ Blood flow 15ml-600ml

FRESENIUS 5008/5008S

Operative screen



AAMI maximum allowable levels of contaminants in R.O. water of HD

CONTAMINANT	AAMI max level for in mg/L
Calcium	2
Magnesium	4
Potassium	8
Sodium	70
Antimony	0.006
Arsenic	0.05
Barium	0.1
Beryllium	0.0004
Cadmium	0.001
Chromium	0.014
Lead	0.005
Mercury	0.0002
Selenium	0.09
Silver	0.005
Aluminum	0.01
Chloramine	0.1
Free chloride	0.50
Copper	0.10
Fluoride	0.20
Nitrate	2
Sulfate	100
Thallium	0.002
Zinc	0.10
Bacteria	<100 CFU/ ml (50 CFU/ml active level)
endotoxin	<0.5 EU/ ml (1 EU/ ml active level)

Ashwamedh Engineers & Consultants
Survey No.102, Plot No.26, Wadala Pathardi Road,
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(Near Guru Gobind Singh School, Near Pandav Nagar,
Turn at Sai Mandir Chowk / Samrat Sweet Turning)
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Ashwamedh
Engineers & Consultants
Laboratory Services Division

U/LR-TC550918000000475P

TEST REPORT

Sample / Report No.	W/10/18/098	Report Date	17/10/2018
Name and address of Customer	Dr. Vasantrao Pawar Medical College, Hospital & Research Centre. At Post. Adgaon, Nashik Maharashtra		
Sample Collected by	Laboratory	Sample Description / Type	Water
Sampling Location	RO Water Outlet Tap at Dialysis Ward	Date - Sampling	11/10/2018
Sample Quantity / Packing	200 ml x 1 no. sterile glass bottle	Date - Receipt of Sample	11/10/2018
Sampling Procedure	APHA, 22nd Ed., 2012, 1060 B, 1-39, 9060 A 9-33 & 9060 B, 9-35 & IS 1622 :1981, RA 2009	Date - Start of Analysis	11/10/2018
Order Reference	As per your P.O. MVPS/HOS/STORE/1133/2018-19 Dated on 11.10.2018	Date - Completion of Analysis	17/10/2018

Sr. No.	Parameter	Result	Unit	Method
1	# Bacterial Endotoxin Test	Passes (Limit: NMT 0.25 EU/ml)	-	Indian Pharmacopoeia, 2007, Vol I, (Part I) Pg-26-30

#Note: The test has been subcontracted to another laboratory.

K. Raj
Kavita Raj
Technical Manager (Microbiology)
AUTHORIZED SIGNATORY

End of Report

Dialysis
Kavita Raj
27/10/18

Note:
1. The result listed refer only to the tested sample(s) and applicable parameter(s).
2. This report is not to be reproduced except in full, without written approval of the laboratory.
3. Perishable samples will be disposed immediately after report dispatch.
4. Non-perishable samples will be stored for 15 days to one month after report dispatch or as per the regulatory norms.

AEC/F/REP/1-A
Page 1 of 1

- ◆ The Unit has 4 full time technician 4 trainee technician, 1 nursing Brother and 2 helper. 1 resident doctor is posted every month in the dialysis unit.
- ◆ Dialysis unit dedicates one machine for HCV positive patients exclusively.
- ◆ The Unit has separate instrument storing and washing area for seropositive and negative patients.
- ◆ Well equipped emergency trolley with adequate drugs and instruments.

Monthly investigation protocol for patient on MHD

- HB %
- BUL
- Serum Creatinine
- BSL
- Serum Calcium
- Serum Phosphorous
- Serum Uric Acid
- SGOT/SGPT

EVERY 3 MONTHLY INVESTIGATIONS

- ❖ Serum Iron
- ❖ Serum Ferritin
- ❖ TIBC
- ❖ Transferrin saturation
- ❖ Serum Vit B12, Folic Acid
- ❖ HBsAG by ELISA
- ❖ HIV by ELISA
- ❖ HCV by ELISA
- ❖ PTH
- ❖ Vitamin D

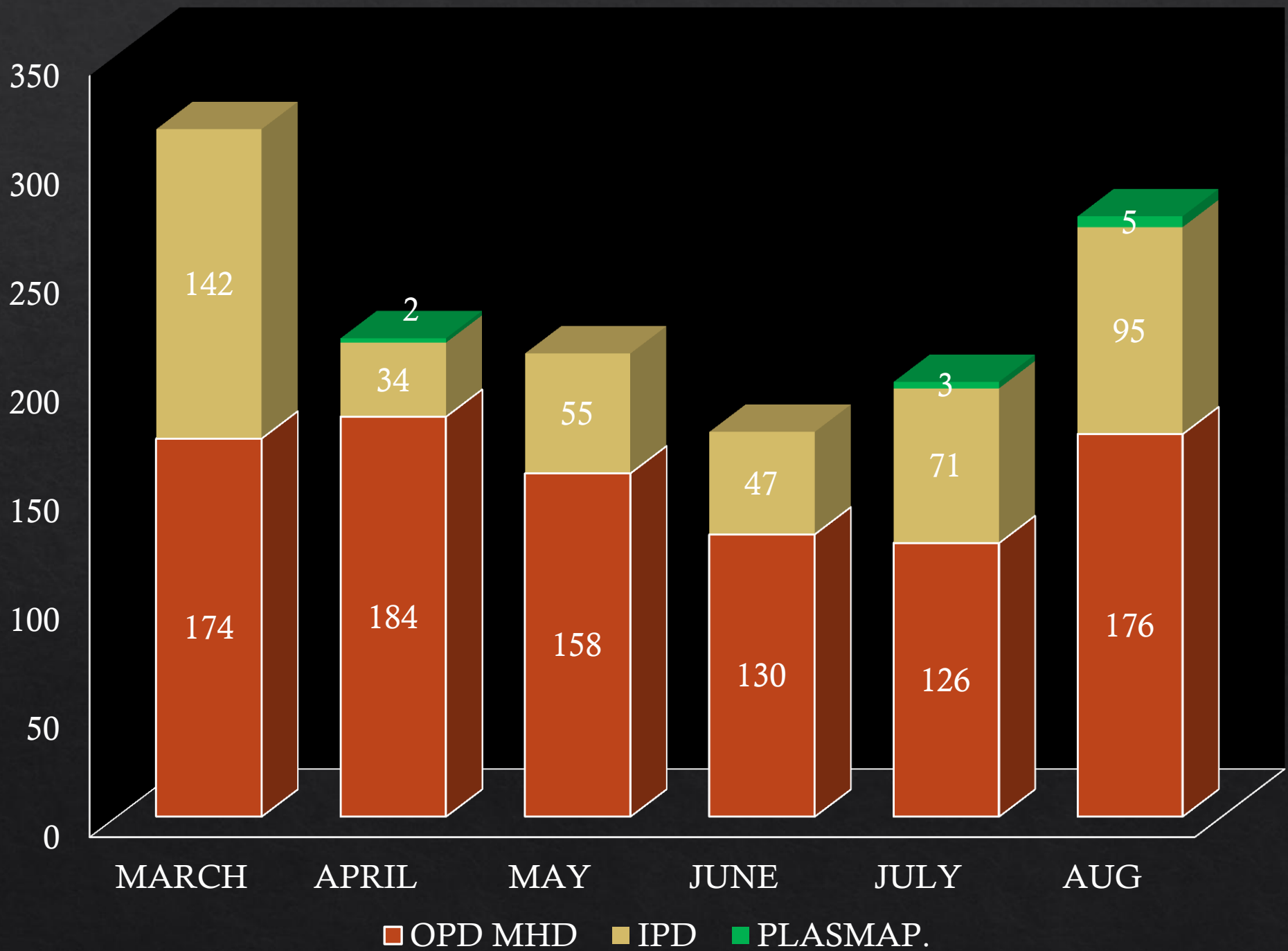
OBJECTIVES of this AUDIT

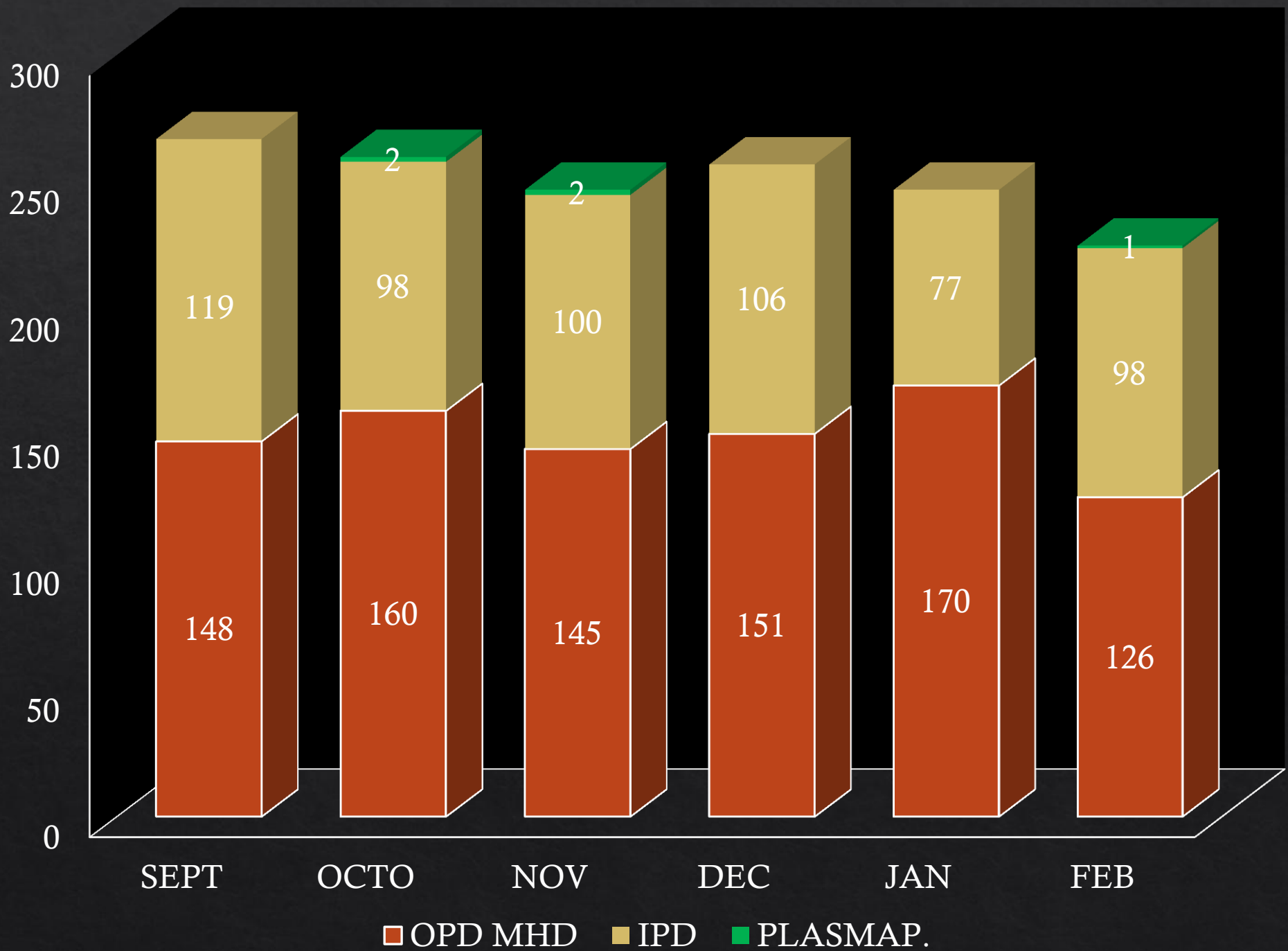
- 1) To assess the work environment in the Dialysis Unit, from the perspective of residents, staff, physicians and administration.
- 2) Seek input on ways to improve the unit's work environment.
- 3) Make recommendations that will enable us to develop and implement solutions.
- 4) Recommend actions that senior management can take to support this renewal process in the Dialysis Unit.

DEMOGRAPHIC PROFILE OF CKD PATIENTS

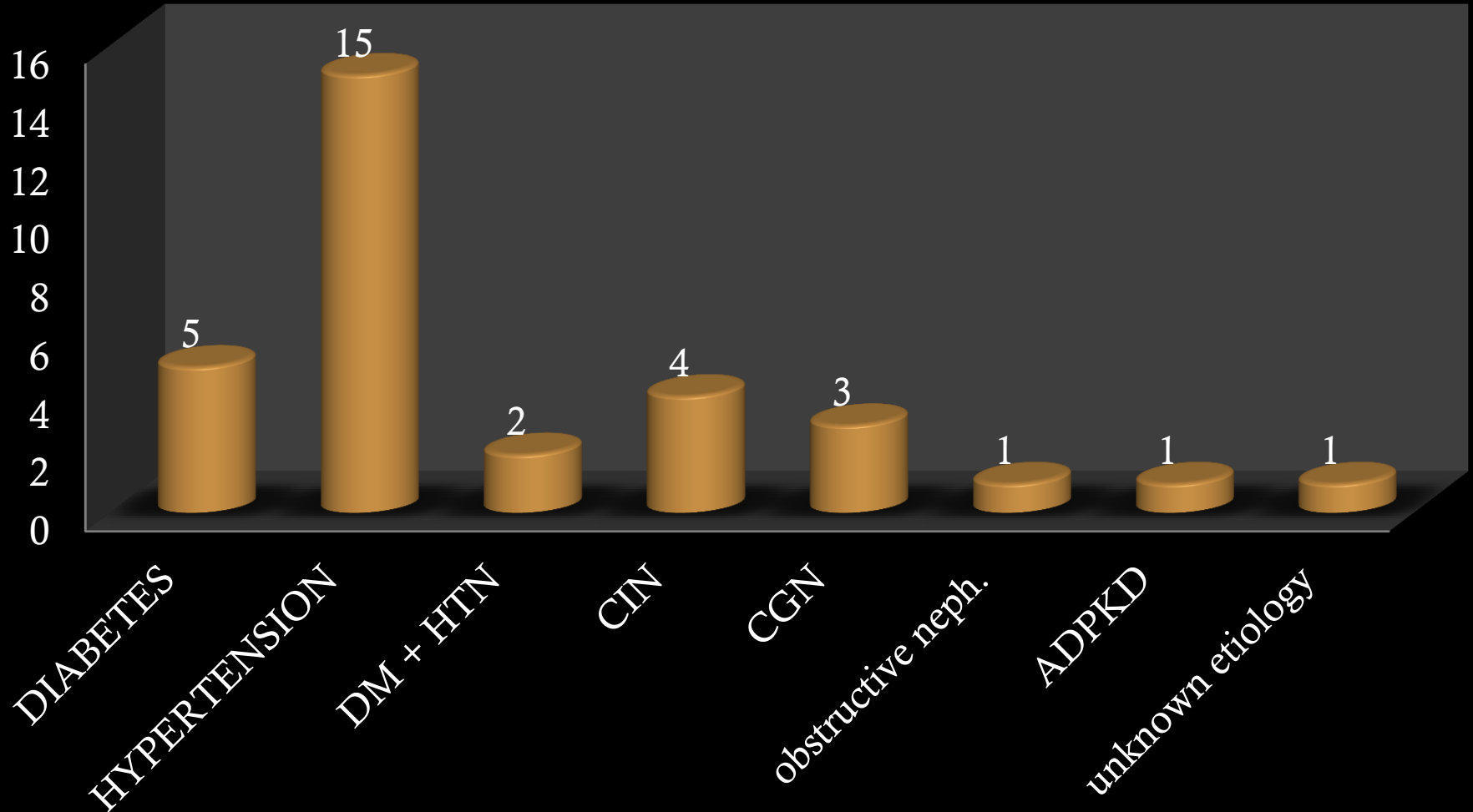
- ◆ The Unit at present has 23 patients of Chronic kidney disease registered for dialysis on OPD basis.
- ◆ Daily 3-5 IPD and 8-10 OPD patients are dialyzed.

- ◇ During the year MARCH 2018 to FEB 2019, total no of dialysis done are **2997**.
- ◇ Out of them 162 dialysis were done in patients with acute kidney injury.
- ◇ The unit has conducted plasmapheresis of 5 patients.
- ◇ All of them had excellent outcome post plasmapheresis.
- ◇ Showing month wise distribution of dialysis done:





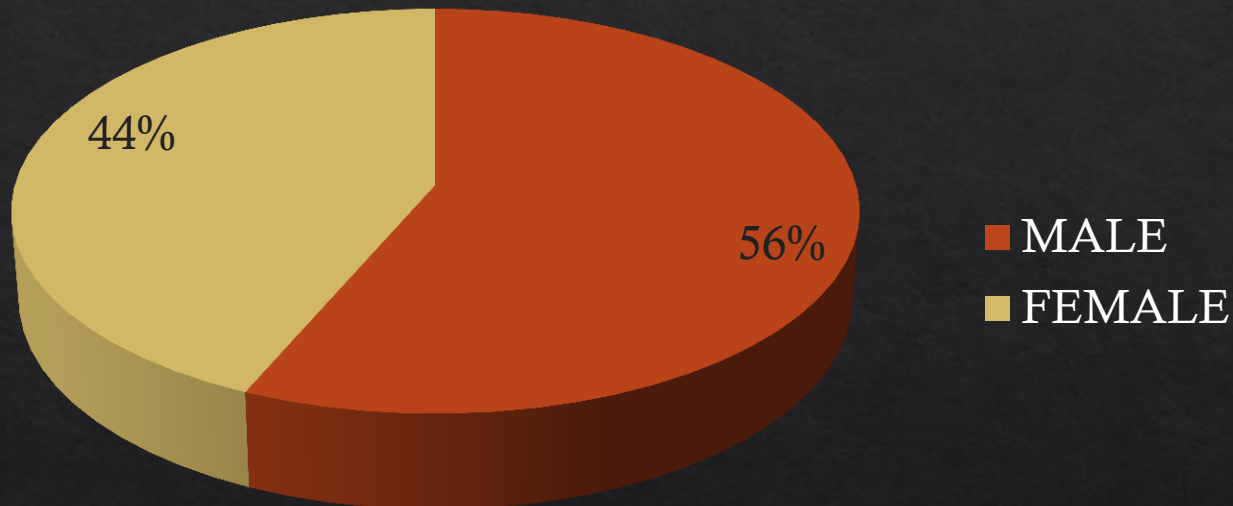
ETIOLOGY OF CKD



■ NO OF PATIENTS (TOTAL – 23)

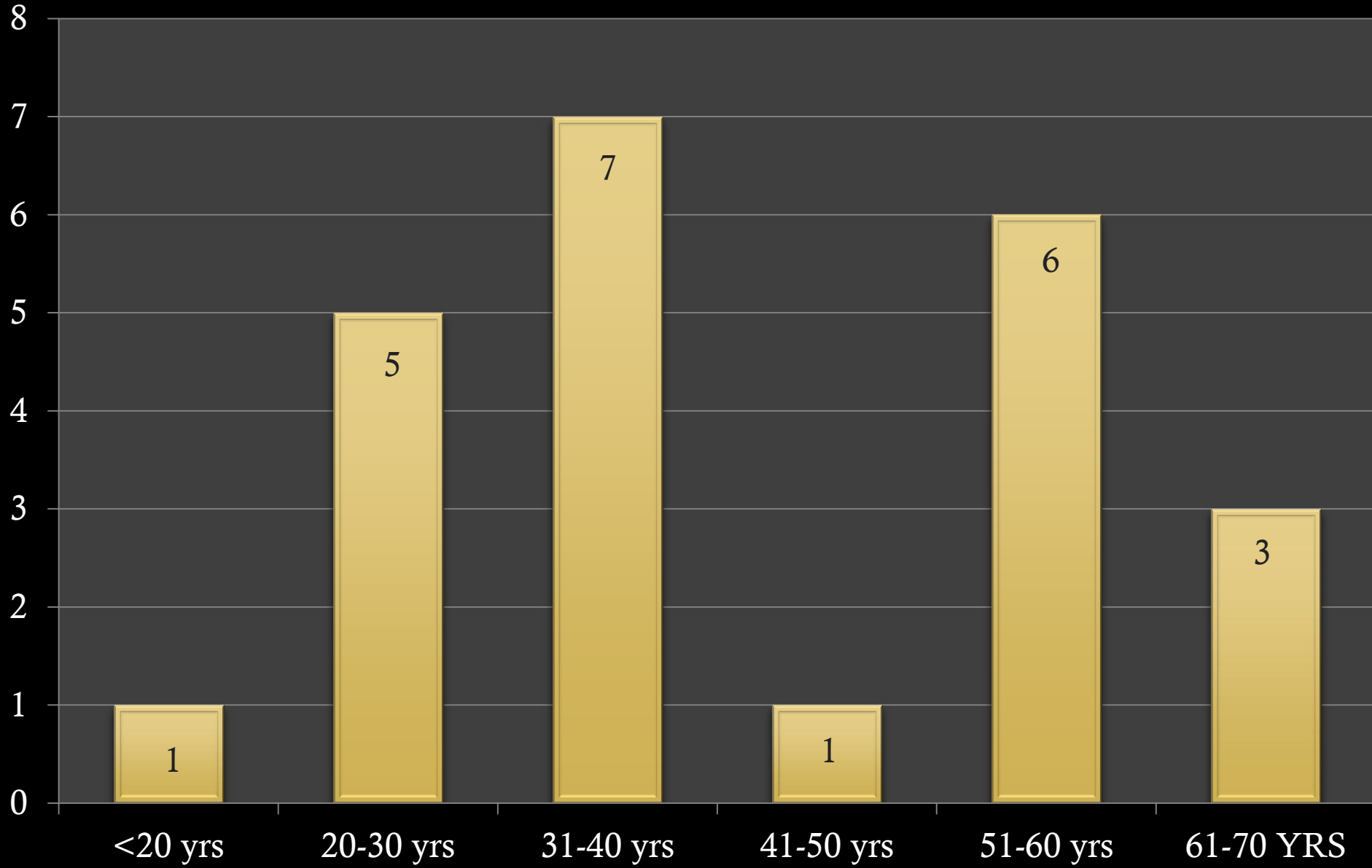
DEMOGRAPHIC PROFILE OF CKD PATIENTS

GENDER DISTRIBUTION

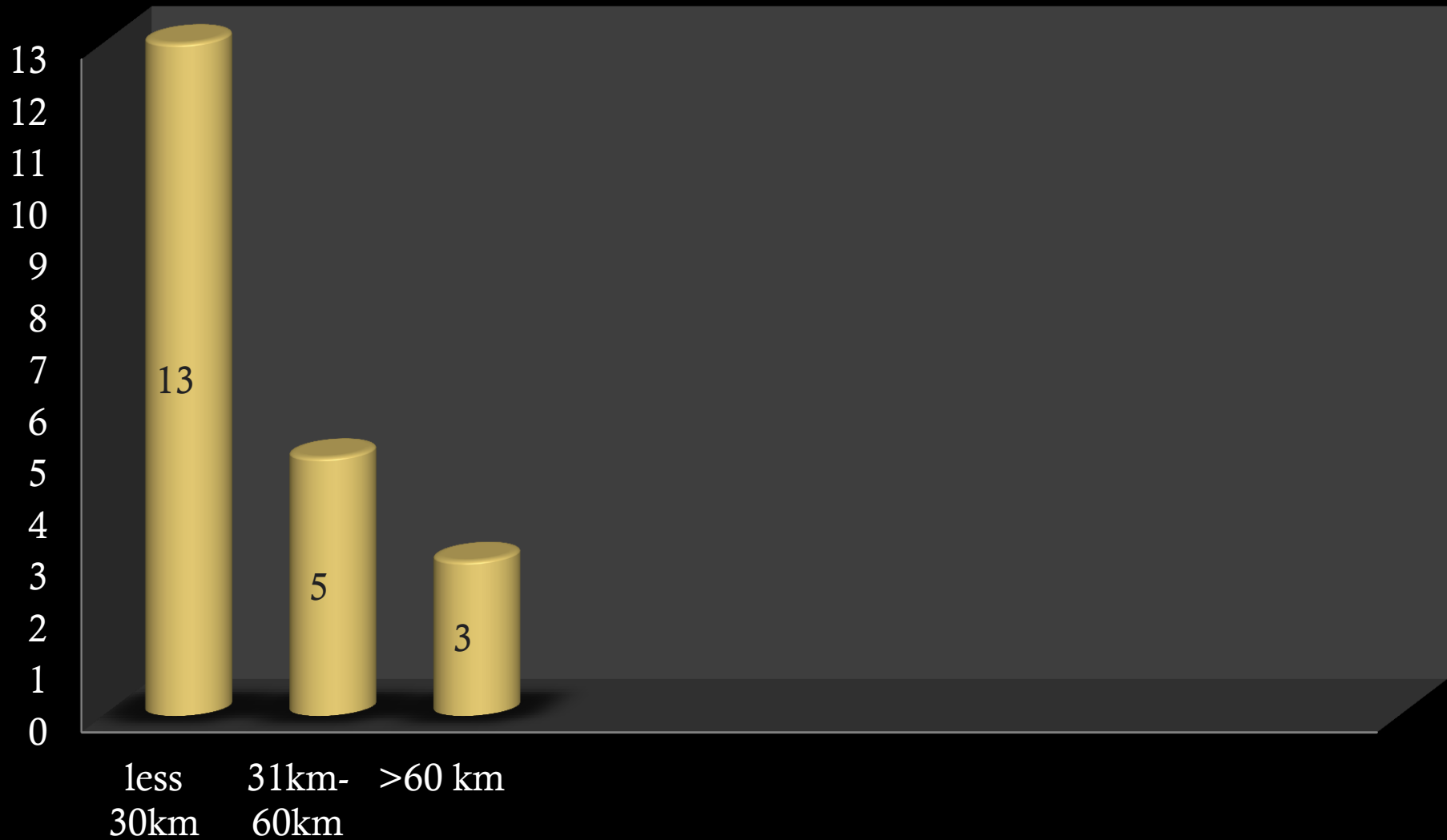


AGE WISE DISTRIBUTION

DISTRIBUTION OF AGE



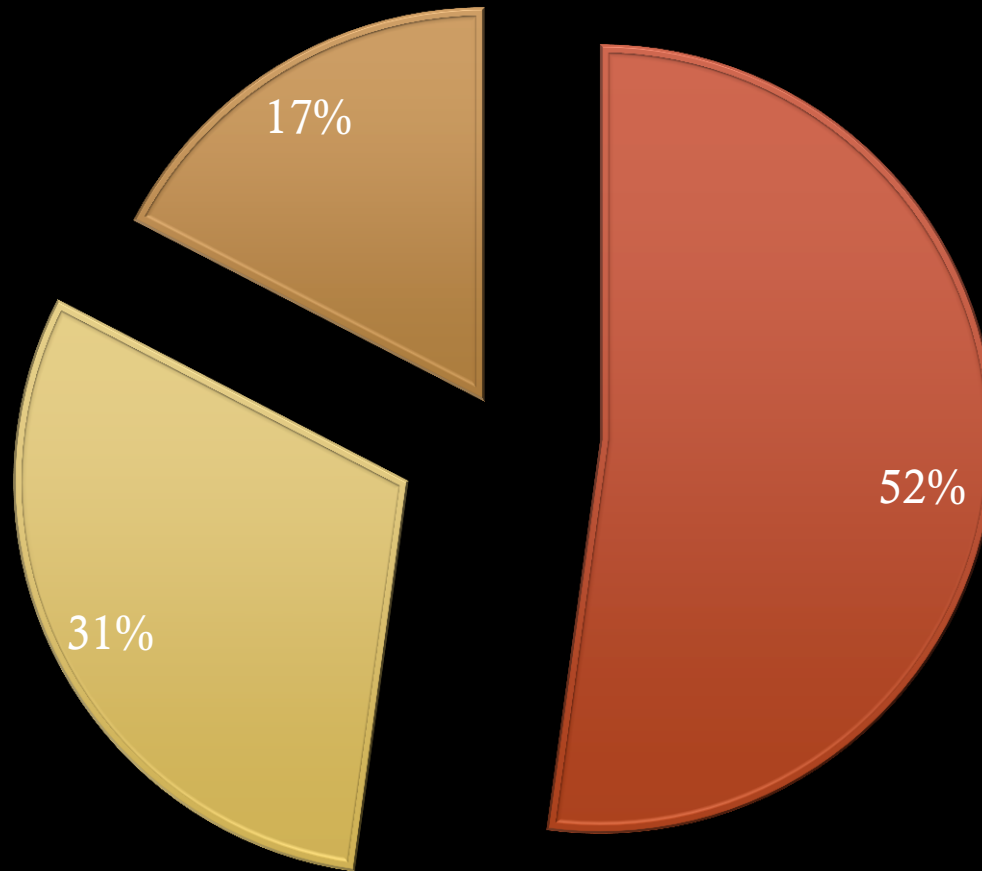
GEOGRAPHICAL DISTRIBUTION



■ NO OF CRE (TOTAL = 23)

FREQUENCY OF HD

■ 2 TIMES ■ 3 TIMES ■ 1 TIME



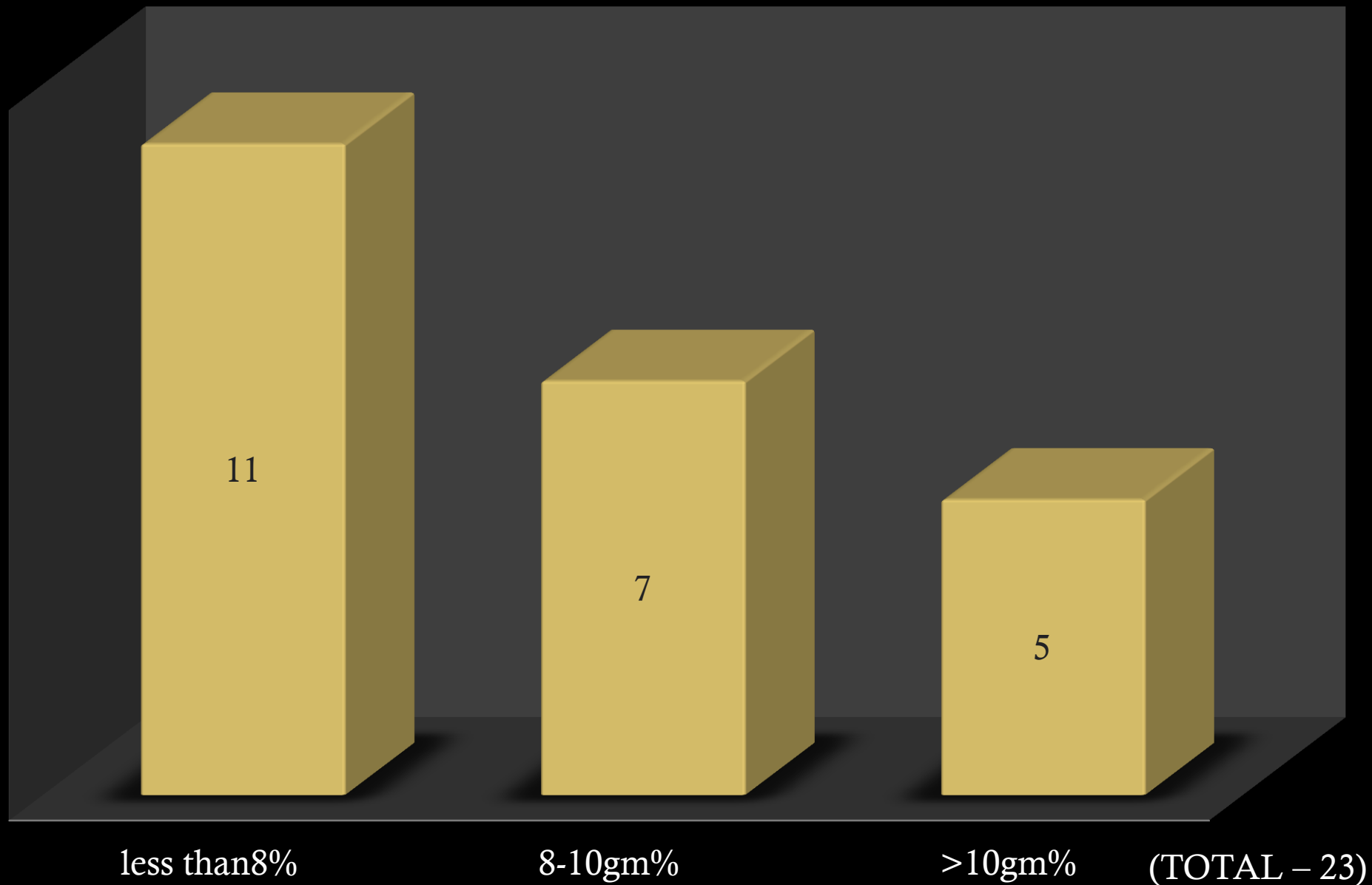
ANEMIA

- ◆ Considering the obvious prevalence of anemia in CKD patients we are following anemia protocol by clinical examination and biochemical tests like -Hemoglobin, Sr. ferritin, TIBC, Transf. saturation done 3 monthly.

- ◆ Treatment is advised as per the situation in the form of
 - oral/IV iron supplementation.
 - recombinant Erythropoietin (EPO)
 - PRC transfusion

RANGE OF HB VALUES OF CKD PATIENTS

■ Hb values



Causes of Hb less than target in our patient

1. Iron deficiency anemia
2. Vitamin B12 deficiency
3. Bone marrow suppression
4. Nutritional
5. Anemia of chronic disease
6. Non adherence to treatment

VACCINATION

- ◇ Considering the increasing number of patients who are developing Hepatitis B during dialysis, we are implementing strict immunization schedule for Hepatitis B.
- ◇ Almost 100% of the patients have either taken full course or taking booster doses regularly.
- ◇ Other immunization that must be given are – influenza vaccine, pneumococcal vaccine

Hepatitis B vaccine

- ◇ Patients should receive **four doses** of hepatitis B vaccine
- ◇ **Recombinant hepatitis B vaccine** is recommended
- ◇ Dose schedule should be **0, 1, 2, and 6 months**
- ◇ Vaccine should be given intramuscular in deltoid regions
- ◇ **Antibody titer** to hep B surface antigen (anti-HBs 1-2 months after the primary course is completed and annually thereafter
- ◇ **Booster dose** should be given if anti-HBs titer falls below 10 mU/ml
- ◇ **Revaccination** with full doses is recommended for persons who do not develop protective antibody titer after primary course.

Pneumococcal Vaccine

The recommendations for administering pneumococcal conjugate vaccine-13 (PCV13) and valent pneumococcal polysaccharide vaccine 23 (PPSV23) in patients with CKD.

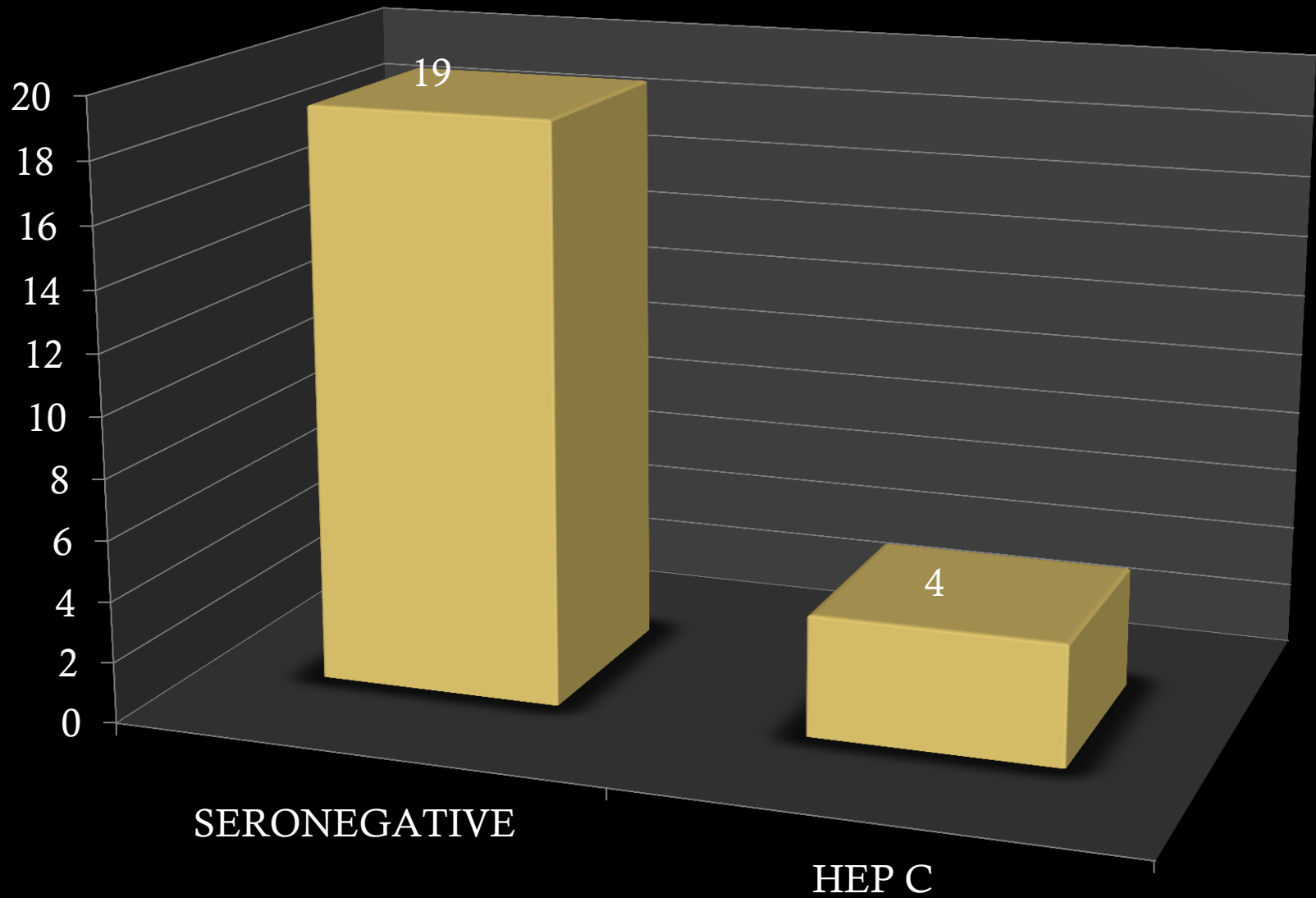
CKD over the age of 19 PCV13 first, followed by a dose of PPSV23 at least 8 weeks later.

Influenza vaccine

- ◇ Given annually before the beginning of the influenza season (winter)
- ◇ The vaccine dose and 0.5 ml i.m

SEROSTATUS

■ NO OF PATIENTS



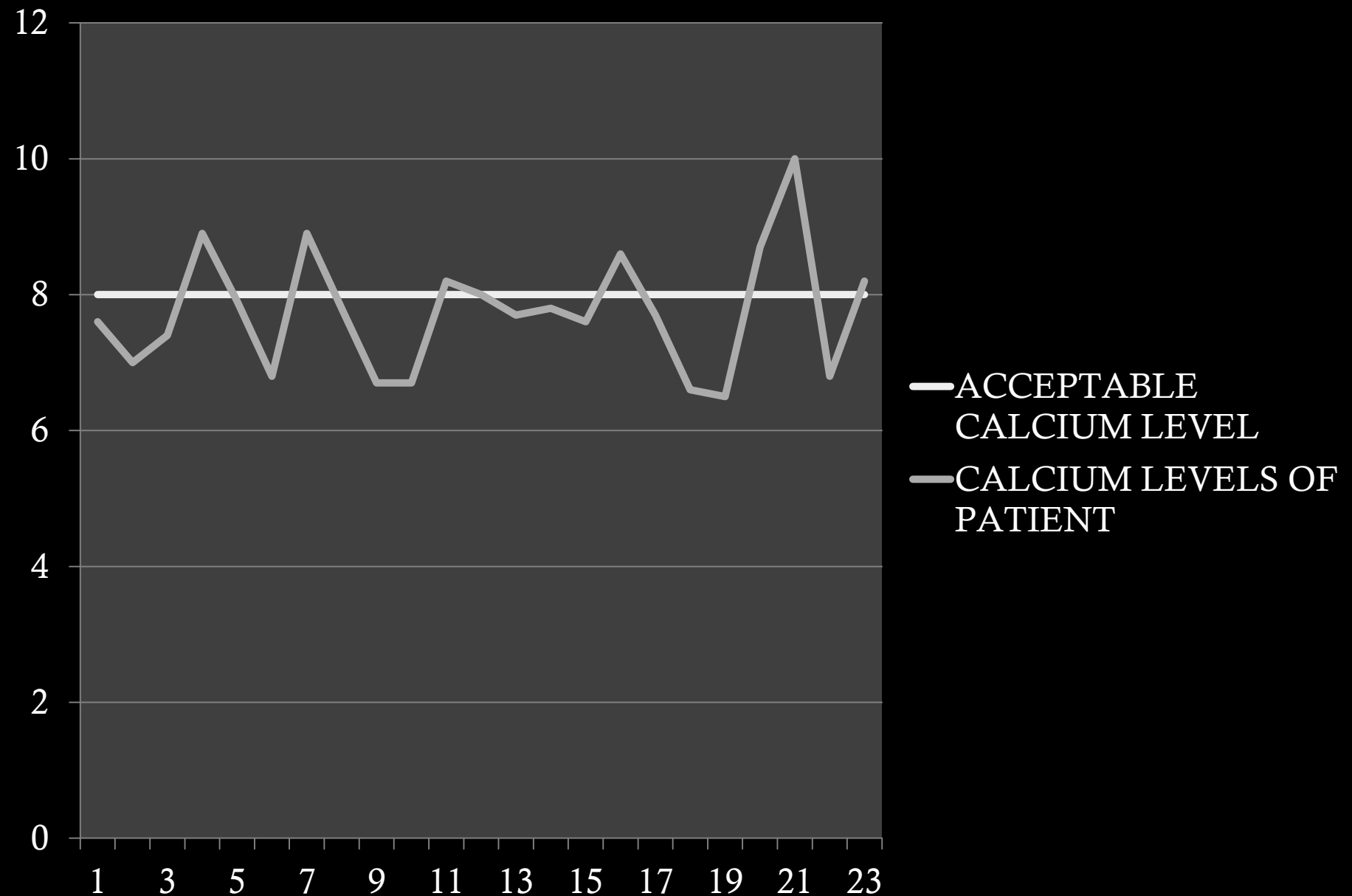
SERO CONVERSION

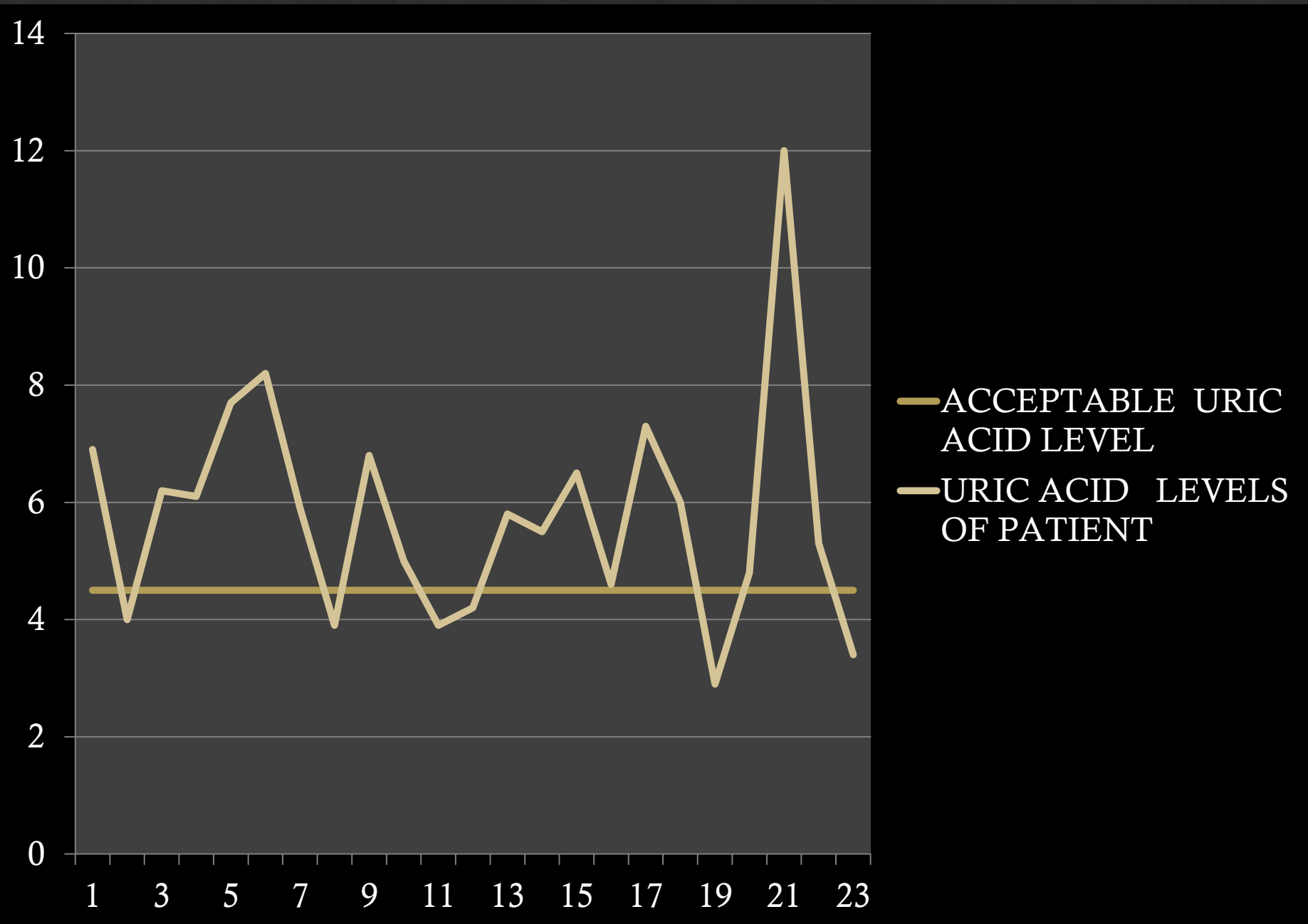
- ◆ Before the beginning of the year we had 4 patients registered Hepatitis C positive.
- ◆ During this year we had 2 other patients registered with us found to be infected with Hepatitis C from outside .
- ◆ No patient had seroconversion at our Centre during the period from march 2018 -Feb. 2019

MONITORING OF CKD PATIENTS

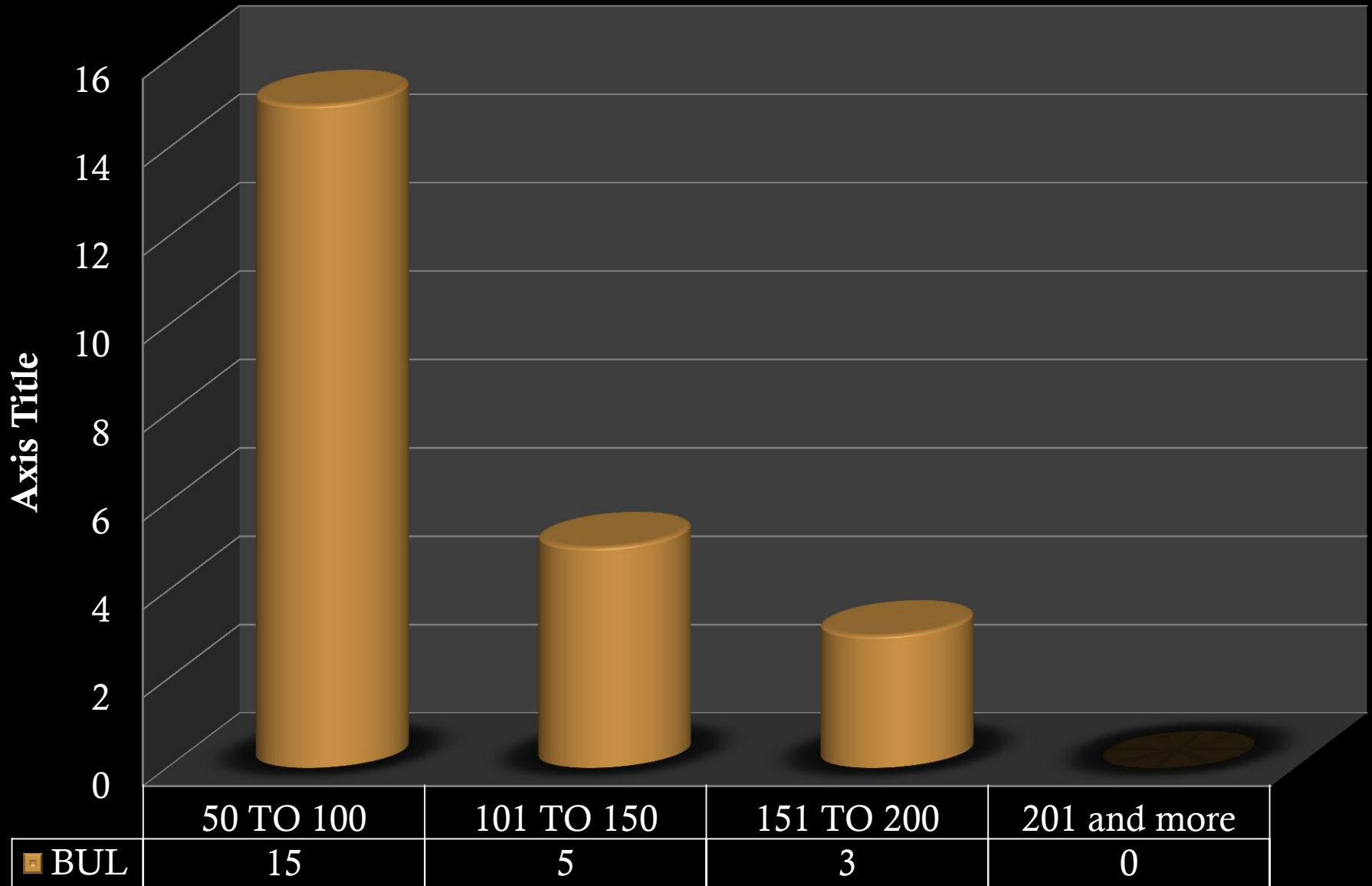
- ◇ We monitor patient's serum parameters
- ◇ Most common parameters we look in patients are
 - sr. calcium.
 - sr. phosphorous.
 - sr. uric acid
 - sr. PTH
 - Vitamin. D

SHOWING DISTRIBUTION OF PATIENTS WITH THEIR RESPECTIVE PARAMETERS.....



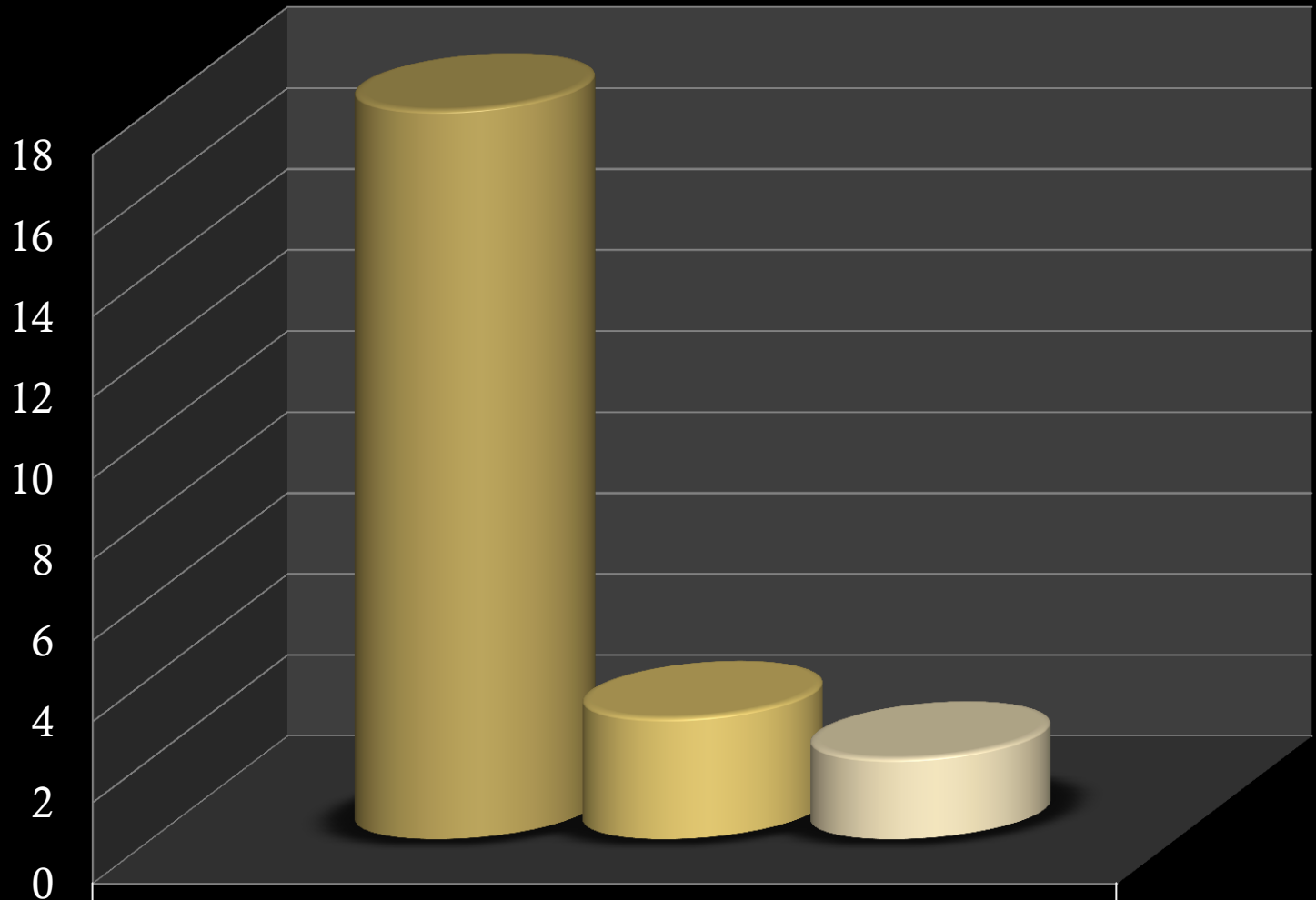


BLOOD UREA LEVEL



(TOTAL – 23)

VASCULAR ACCESS



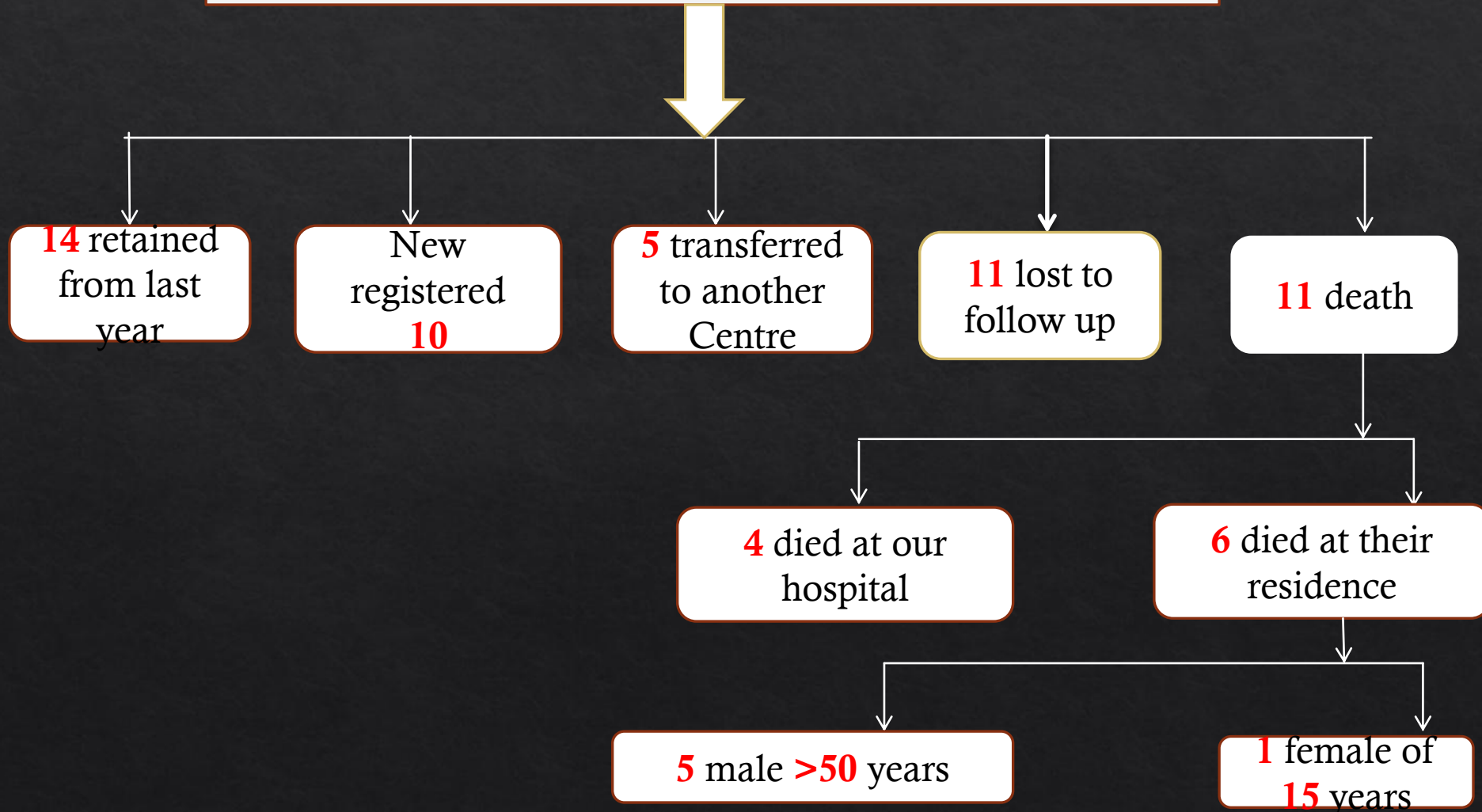
<div></div> A-V FISTULA	18
<div></div> perma .cath	3
<div></div> temporary cathetar	2

Vascular access

- ◇ From march 2018 to February 2019 we have done
- ◇ 8 permanent catheterization
- ◇ 24 Arteriovenous fistula surgery
- ◇ 3 A-V fistula repair
 - ◇ out of which 2 was successful
 - ◇ And 1 we fail to salvage

Outcome of CKD patient

From MARCH 2018 TO FEB 2019 we had 51 patient enrolled with us for opd basis dialysis



COMPLICATION DURING HEMODIALYSIS

◇ Most common complications encountered during hemodialysis of most patients are :

➤ **Hypotension:** - underestimation of dry weight. - avoid anti-hypertensive 4 hours before HD.

- head low position –bolus NS - inotropic support if required. - Decreasing dialysate temperature.

➤ **Muscle cramps:** use of dialysate with low Na conc.

High UF removal

Rx: bolus NS,

50% Dextrose infusion,

local massage; application of moist heat

Quinine sulphate, vit E and carnitine

nausea/vomiting
headache
backache



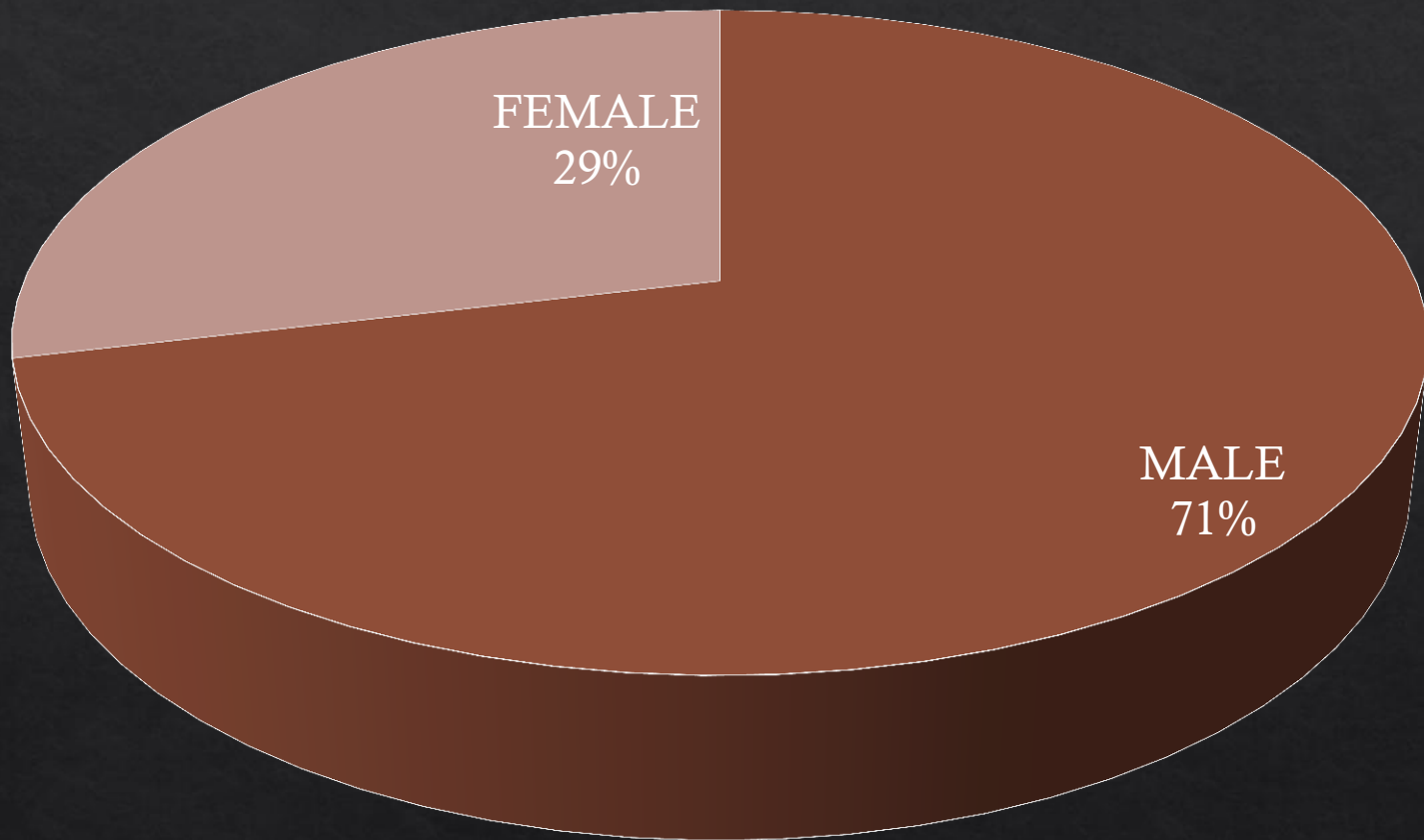
Reducing rate of blood flow
Avoid sugary meals prior to dialysis
Decreasing solute clearance rate by
reversing the countercurrent mechanism.

ACUTE KIDNEY INJURY

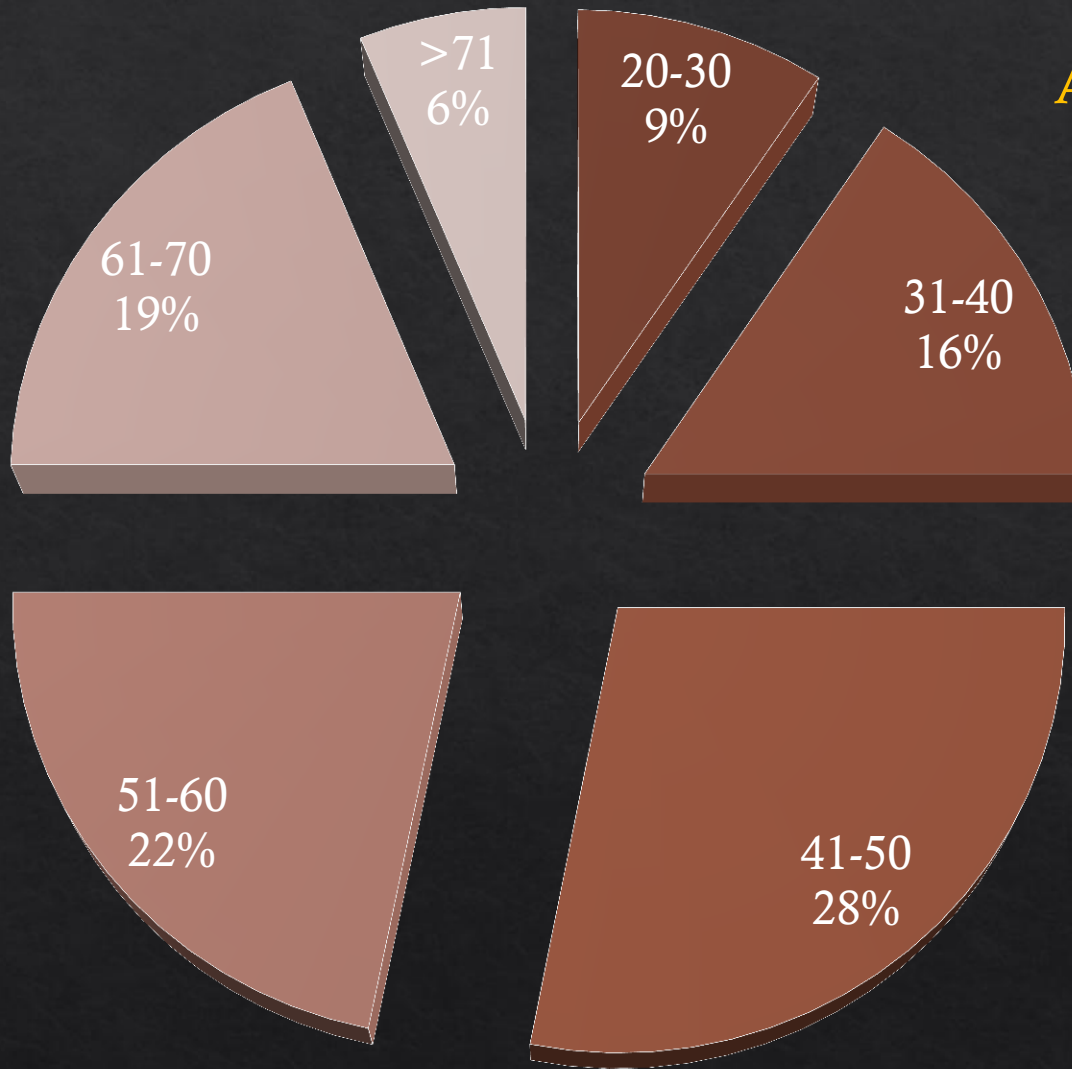
- ◇ During period of MARCH 2018 to FEB 2019 we had 108 patients who presented as acute kidney injury and required total of 162 dialysis.

Details are given in the pie charts below:

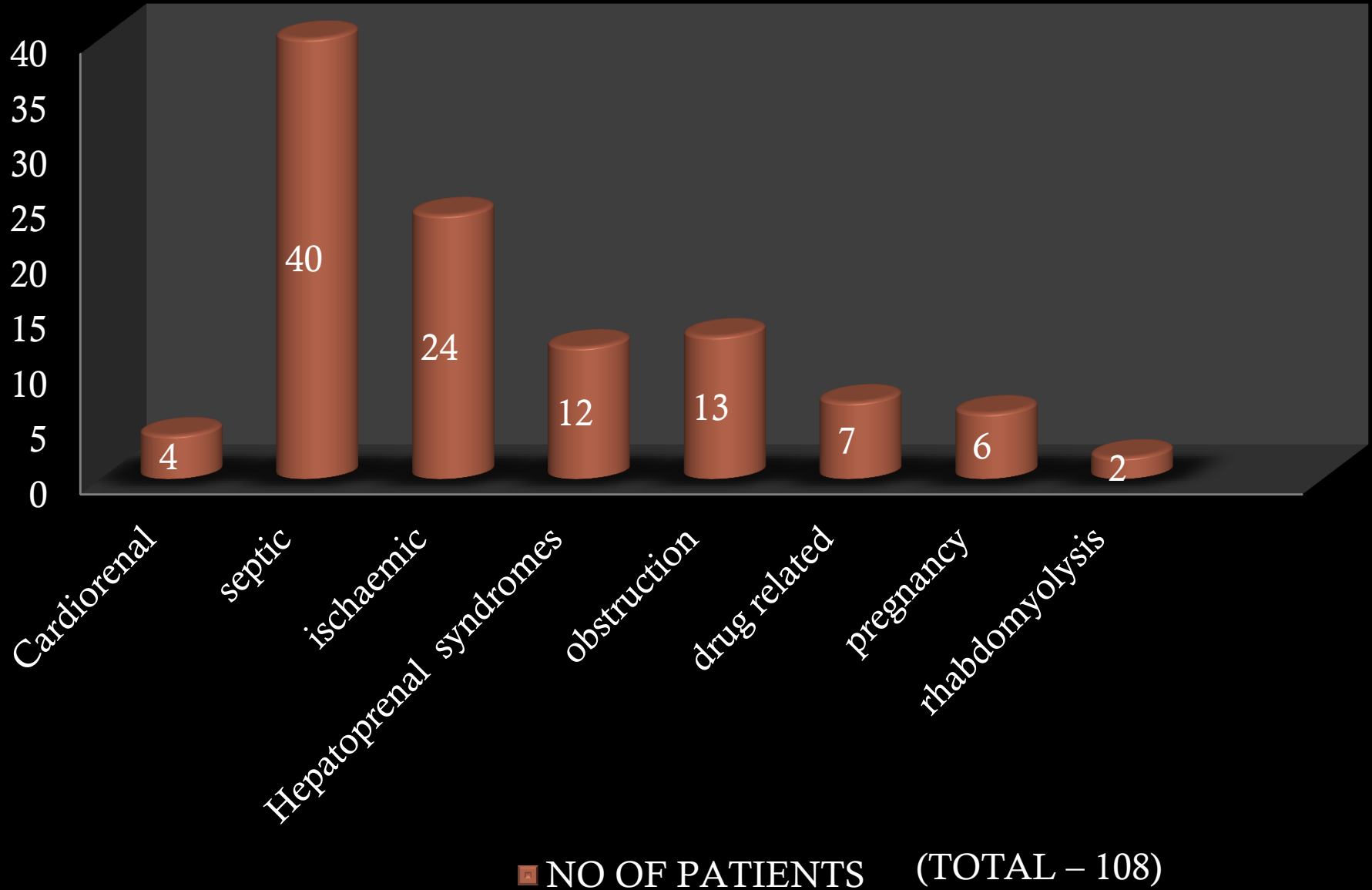
AGE DISTRIBUTION OF PATIENTS WITH AKI



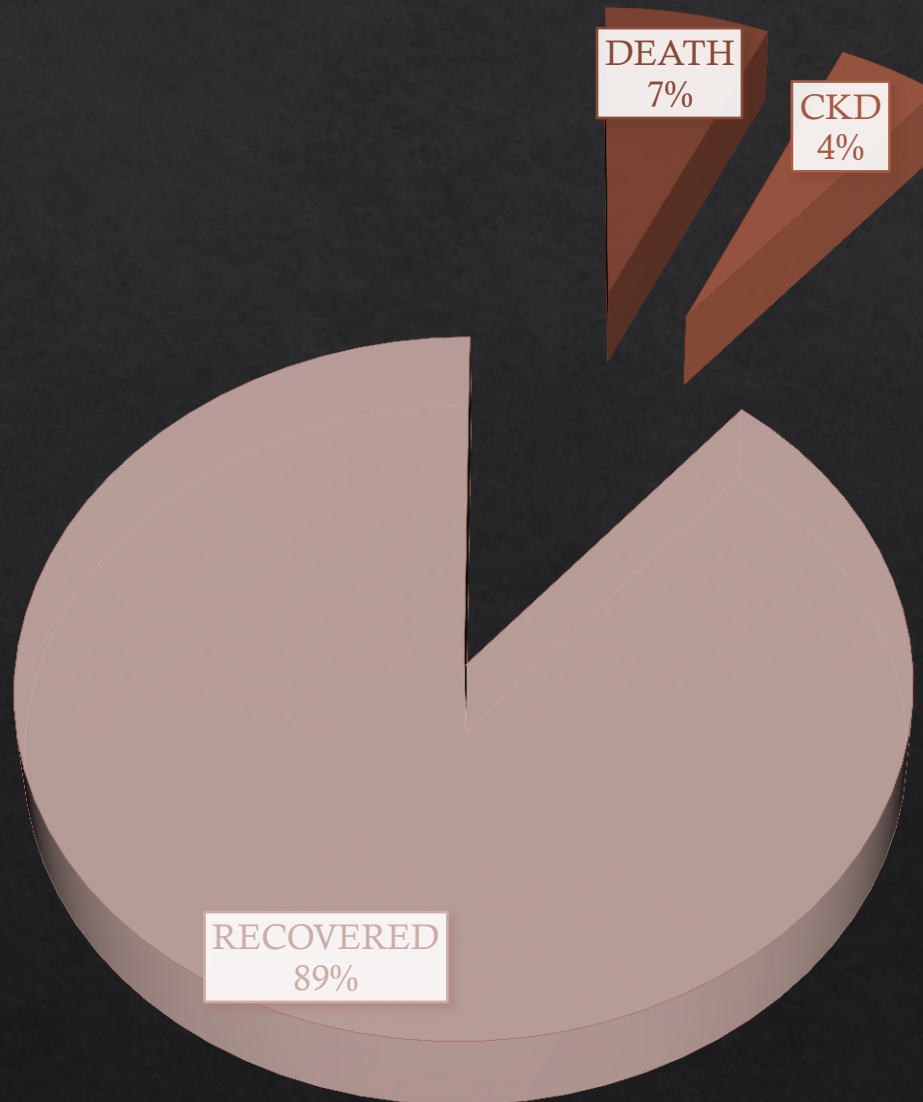
(TOTAL – 108

**AGE GROUPS
IN YEARS**

ETIOLOGY OF AKI



OUTCOME OF PATIENTS WITH AKI FOLLOWING TREATMENT



(TOTAL – 108)

PLASMAPHERESIS

During plasmapheresis, blood is initially taken out of the body through catheter.

Plasma of patient is replaced with fresh plasma from donor.

During this procedure antibody's which are culprit in certain autoimmune diseases are exchanged with normal antibodies.

Indication of plasmapheresis:

GBS

Myasthenia gravis

Graves disease

Multiple sclerosis

TTP

Wegener's granulomatosis.

FSGS

- ◆ In our unit now main indication for which plasmapheresis done is **GBS**
- ◆ We had treated 3 patients of **GBS** out of which 3 patients recovered completely
- ◆ One patient underwent plasmapheresis for **Neuromyelitis optica** antibodies.
- ◆ One for **Atypical HUS** for factor H antibody.
- ◆ Both had EXCELLENT results

Since the last year...

- ◆ Patients compliant with protocol has increased from 68 to 75%
- ◆ The percentage of patients having an Hb in the range of 6-9gm/dl was 60% which is increased to 69% this year.
- ◆ Compliance to EPO injections was 40% last year this year it is increased to 56%
- ◆ The number of seroconversions to hepatitis C was 4 patients last year this year we had no seroconversion
- ◆ Last year, 13.3 % deaths occurred in our regular MHD CKD patient population and 20 % were lost to follow up. In comparison, there were 21% deaths and 21% were lost to follow up in 2018-19
- ◆ The total number of AKI pts requiring dialysis this year were 108; last years figure being 32; total recovery being 89% this year as compared to 59% last year., 4% patients progressed to CKD as compared to 16% of last year

RECOMMENDATIONS and DISCUSSIONS

- ◊ We need good nutritional review.
- ◊ We want dietician to attend nephro round daily.
- ◊ We need better and train staff and technician.
- ◊ We want management to be aggressive about CRRT.
- ◊ We need to start Hep B machine .
- ◊ We have surgeon to do fistula but OT tables are not available so we want one day for fistula surgery.
- ◊ Patients are not doing outside investigation because of cost issue ,so please give subsidised rate for outside investigation.

- ◊ Dialysis software to be sought for computerized reports and data storage
- ◊ Training of patients / staff regarding the existing laboratory database -PALAASH
- ◊ To have 3 monthly meetings about the requirements of dialysis.
- ◊ To consider accountability of the technicians. To make him/her answerable for the equipment and to convey dialysis related issues to the HOD through the resident.
- ◊ The surgeon should liaison with the physician about the AV fistula to ease post operative management
- ◊ To have a separate dialysis room for sero negative and positive patients to minimize cross contamination



*Thank you for
your patience*