

# STAGES OF CKD

## NKF CLASSIFICATION SYSTEM

STAGE 1: GFR > 90 ML/MIN DESPITE KIDNEY DAMAGE

STAGE 2: MILD REDUCTION (GFR 60 – 89 ML/MIN)

GFR OF 60 MAY REPRESENT 50% LOSS IN FUNCTION.



## DURING STAGE 1 - 2

- ***NO SYMPTOMS***
- SERUM CREATININE DOUBLES\*
- (UP TO ***50%*** NEPHRON LOSS)



# STAGES OF CKD

## NKF CLASSIFICATION SYSTEM

STAGE 3: MODERATE REDUCTION (GFR 30 – 59 ML/MIN)

1. CALCIUM ABSORPTION DECREASES

(FROM THE GI TRACT)

2. MALNUTRITION ONSET

3. ANEMIA

4. LEFT VENTRICULAR HYPERTROPHY



# STAGES OF CKD

## NKF CLASSIFICATION SYSTEM

STAGE 4: SEVERE REDUCTION (GFR 15 – 29 ML/MIN)

1. SERUM TRIGLYCERIDES



2. *HYPER*PHOSPHATEMIA



3. METABOLIC *ACIDOSIS*

4. *HYPER*KALEMIA

# STAGES OF CKD-NKF CLASSIFICATION SYSTEM

STAGE 5: KIDNEY FAILURE (GFR < 15 ML/MIN)

***ESRD!!!***

- AZOTEMIA
- RESIDUAL FUNCTION < ***15% OF NORMAL***
- EXCRETORY, REGULATORY, HORMONAL FUNCTIONS SEVERELY IMPAIRED
- METABOLIC ***ACIDOSIS*** ([KUSSMAUL BREATHING](#))
- MARKED  : BUN, CREATININE, PHOSPHOROUS
- MARKED  : HEMOGLOBIN, HEMATOCRIT, CALCIUM
- FLUID ***OVERLOAD***



# TREATMENT OPTIONS

- *CONSERVATIVE THERAPY* \* (*SEVERE RESTRICTIONS, DIETARY, FLUIDS MAINTAIN RENAL FUNCTION AS LONG AS POSSIBLE- IF GFR > 10ML/MIN*)
- HEMODIALYSIS
- PERITONEAL DIALYSIS
- TRANSPLANT
- ***NOTHING > DEATH***



# CONSERVATIVE TREATMENT GOALS

- DETECT/TREAT POTENTIALLY REVERSIBLE CAUSES OF RENAL FAILURE
- PRESERVE EXISTING RENAL FUNCTION
- TREAT MANIFESTATIONS
- PREVENT COMPLICATIONS
- PROVIDE FOR COMFORT

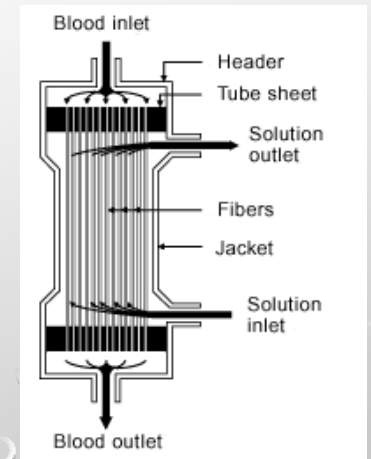
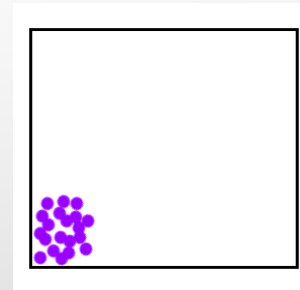
# HEMODIALYSIS

- REMOVAL OF SOLUBLE SUBSTANCES AND WATER FROM THE BLOOD BY ***DIFFUSION*** THROUGH A SEMI-PERMEABLE MEMBRANE.
- EARLY ANIMAL EXPERIMENTS BEGAN 1913
- 1ST HUMAN DIALYSIS 1940'S BY DUTCH PHYSICIAN WILLEM KOLFF (2 OF 17 PATIENTS SURVIVED)
- CONSIDERED EXPERIMENTAL THROUGH 1950'S, NO INTERMITTENT BLOOD ACCESS; FOR ACUTE RENAL FAILURE ONLY.
- 1960 DR. SCRIBNER DEVELOPED SCRIBNER SHUNT-1960'S MACHINES EXPENSIVE, SCARCE, NO FUNDING.
- "DEATH PANELS" PANELS WITHIN COMMUNITY DECIDED WHO GOT TO DIALYZE.

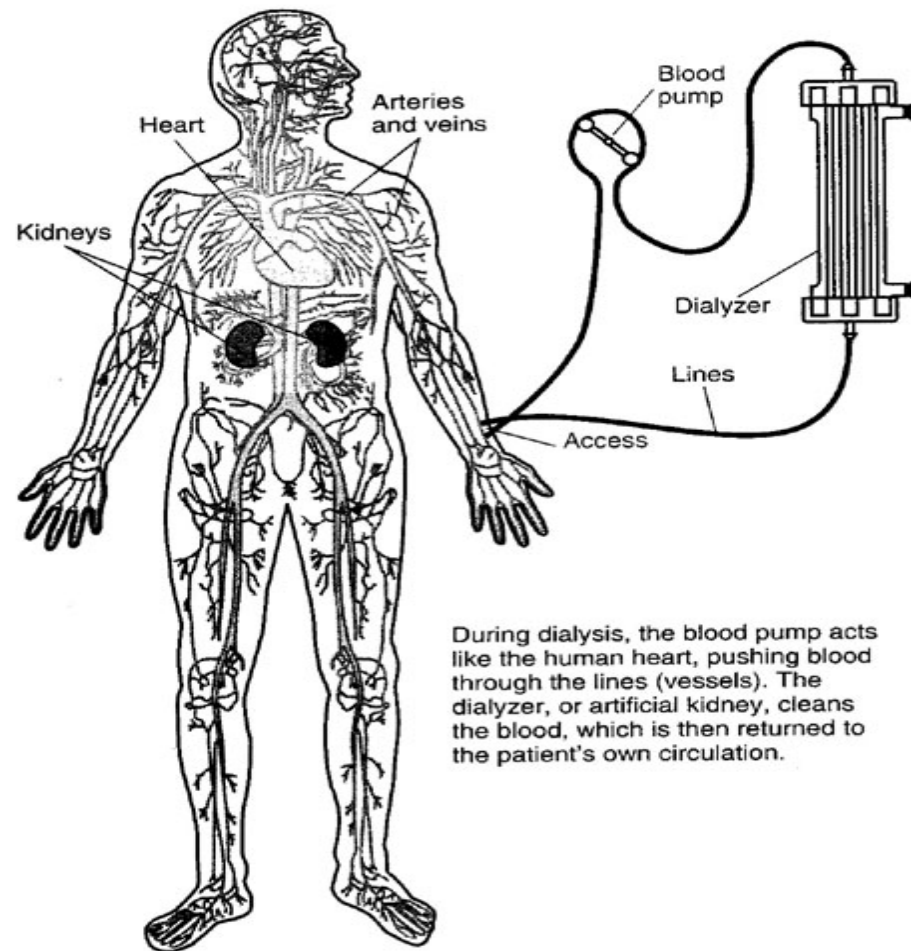


# HEMODIALYSIS PROCESS

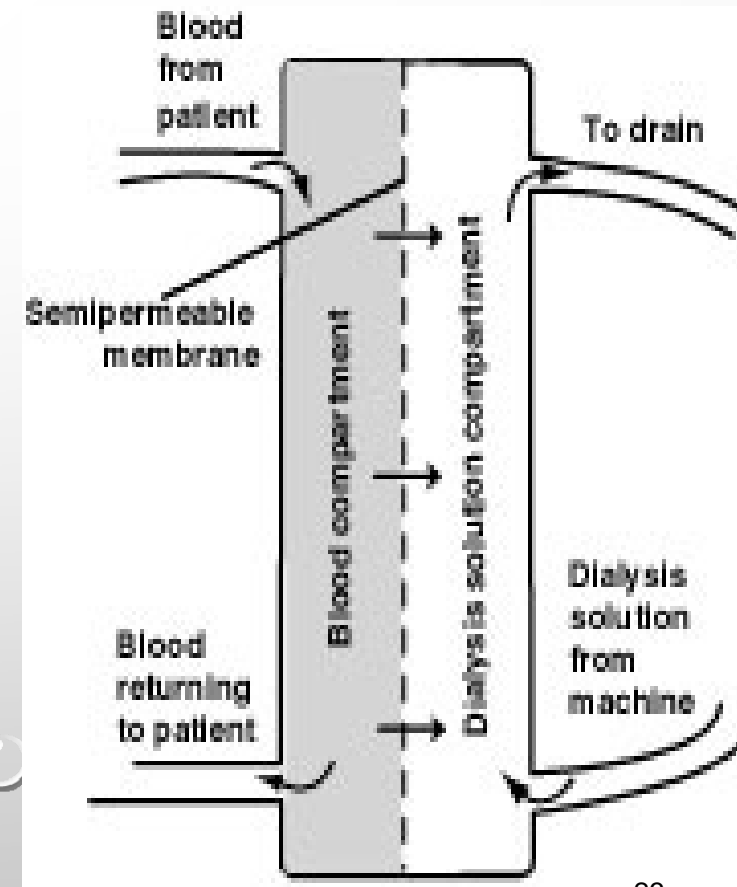
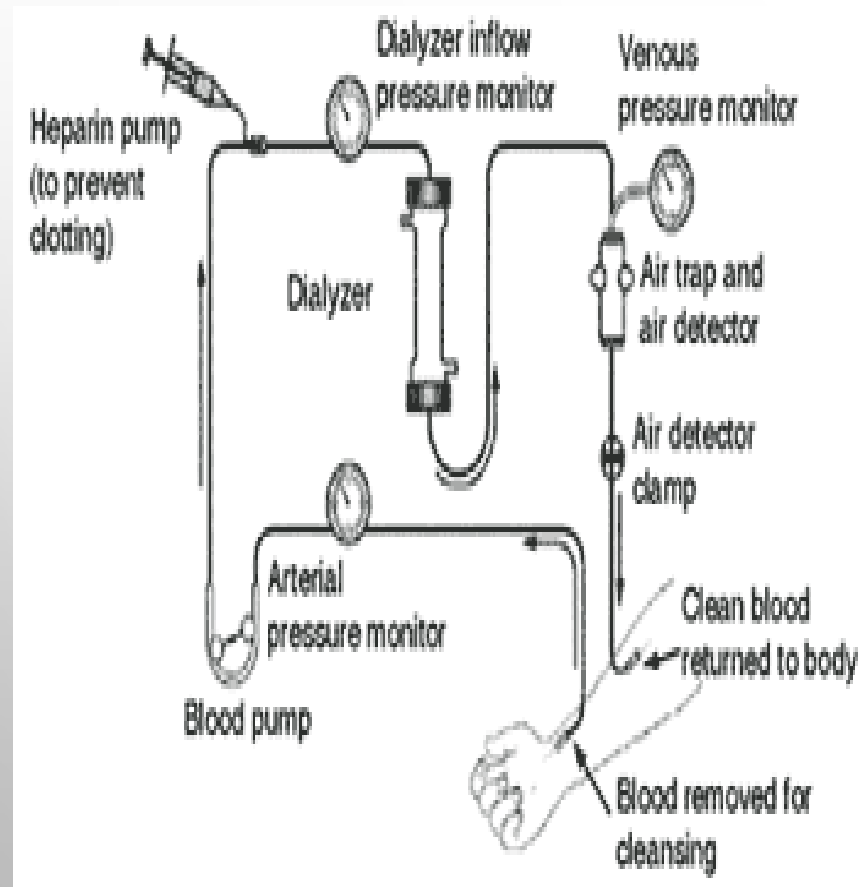
- BLOOD REMOVED FROM PATIENT INTO EXTRACORPOREAL CIRCUIT.
- DIFFUSION AND ULTRAFILTRATION TAKE PLACE IN DIALYZER.
- CLEANED BLOOD RETURNED TO PATIENT.



# EXTRACORPOREAL CIRCUIT



# HOW HEMODIALYSIS WORKS



[How Dialysis Works-Interactive!](#)

An [Introduction to Dialysis-How Stuff Works!](#) (Step by Step)

[YouTube- Hemodialysis!](#) Great!

