DIALYSIS PATIENTS AND NURSING PERSPECTIVES

Objectives

I - Treatment options
   i - What is Hemodialysis
   ii - When dialysis is important.
   iii - Principles of dialysis
   iv - Dialyzer
   v - Vascular access
   vi - Nursing role

II - Peritoneal dialysis
   i - Types of PD
   ii - Principle of Dialysis
   iii - Nursing care

III - References
ESRD TREATMENT OPTIONS

ESRD

Hemodialysis

Peritoneal

Kidney Transplant
ESRD TREATMENT OPTIONS

- Hemodialysis
- Peritoneal
- Kidney Transplant
WHAT IS HEMODIALYSIS

Dialysis is defined as the diffusion of molecules in solution across a semipermeable membrane from a high concentration to a low concentration.

The primary goal of hemodialysis is to restore the intracellular and extracellular fluid environment that is characteristic of normal kidney function.

In another word, Dialysis is defined as the artificial process of eliminating waste (diffusion) and unwanted water (ultrafiltration) from the blood.
WHEN DIALYSIS IS IMPORTANT

In acute renal failure, when the renal function has deteriorated to an extent that is threatening the body’s physiology. And exhibit signs and symptoms.

When kidney function goes below 10% to 15%.

GFR falls below 10/ml/min

Signs of uremic syndrome, such as nausea, vomiting, loss of appetite, and fatigue.

High levels of potassium in the blood (hyperkalemia).

Signs of the kidneys' inability to rid the body of daily excess fluid intake, such as swelling.

High levels of acid in the blood (acidosis).

Inflammation of the sac that surrounds the heart (pericarditis)
PRINCIPLE OF HEMO-DIALYSIS

- Diffusion → Solute removal
- Osmosis → Fluid removal
- Ultrafiltration → (Osmotic pressure gradient)

- Electrolyte correction.
- Body fluid balance
- Acid-balance control
- Blood purification
Inside the Dialyzer

Blood from your body enters the machine and flows past one side of a membrane.

The membrane is a barrier that keeps blood and dialysate from mixing, but lets waste through.

Dialysate is a special fluid that pulls waste from blood. It flows past the other side of the membrane.

Waste, extra fluid, and chemicals move through the membrane into the dialysate.

Clean, filtered blood goes back to your body.
WHAT IS DIALYSATE

Dialysate is a solution, prepared as a chemical composition, to be as similar to normal plasma as possible.

It carries away waste materials and excess fluid extracted from the blood by the dialysis process.

The five chemicals that are most frequently used to make dialysate are as follows:
- sodium chloride
- sodium bicarbonate or sodium acetate
- calcium chloride
- potassium chloride
- magnesium chloride
- Glucose
PRINCIPLE OF HEMODIALYSIS

Hemodialysis machine
Unfiltered blood flows to dialyzer
Filtered blood flows back to body

Hemodialyzer (Where filtering takes place)

Vein
Artery
HEMODIALYSIS VASCULAR ACCESS

Polytetrafluoroethylene
QUESTION 1

Which type of vascular access is associated with better outcomes in hemodialysis patients? (choose one answer):

1. Central venous cuffed catheter
2. Arteriovenous graft
3. Arteriovenous
4. Temporary central venous catheter
SAVE THE NON-DOMINANT ARM FOR VASCULAR ACCESS

When GFR < 30 mL/min
- No BP measurement
- No IV
- No Blood Draws

On Non-Dominant Arm

Place vascular access within a year of hemodialysis anticipation.
NURSING CARE FOR VASCULAR ACCESS

Educate patients.
no BP measurements, venipunctures, or injections on the affected side.
Perform hand hygiene before you assess or touch the vascular access.
Assess fistula every dialysis session

Palpate the vascular access to feel for a thrill or vibration that indicates arterial and venous blood flow and patency.

Auscultate the vascular access with a stethoscope to detect a bruit or "swishing" sound that indicates patency.
INITIATION OF A NEW FISTULA

- Fistula assessment after 4 weeks post surgery
- Before each dialysis session: Look, Listen and feel.
- Secure an order
- Adjust heparin dose
- Always use tourniquet.
- Use 17 gauge needles initially.
- Use one lumen of the catheter venous and one needle fistula (arterial).
- Always cannulate the needles in opposite directions.
- After 3-6 treatments with 17 gauge you can advance to 16 gauge.
- Upon removal: use two fingers compression for continuous 10 minutes. Never use clamps

17 gauge needle = 200-250
16 gauge needle = 250-350
15 gauge needle = 350-450
**COMPLICATION OF HEMODIALYSIS**

- Hypotension
- Cramps
- Headache
- Chest pain (associated with hypotension, always consider angina)
- Itching
- Fever and chills
- Back pain
- Hemolysis (usually due to overheating, bleach, chloramine,..)
PERITONEAL DIALYSIS (PD)
Abdominal cavity is lined by peritoneal membrane which acts as a semi-permeable membrane. 
Diffusion of solutes (urea, creatinine, ...) from blood into the dialysate contained in the abdominal cavity.
Removal of excess water (ultrafiltration) due to osmotic gradient generated by glucose in dialysate.
PRINCIPLES OF PD

- Diffusion $\rightarrow$ Solute removal
- Osmosis $\rightarrow$ Fluid removal

- Electrolyte correction.
- Body fluid balance
- Acid-balance control
- Blood purification
PERITONEAL DIALYSIS (PD)

PD

Continuous  Intermittent
Help reduce the risk to your kidneys.
NURSING ROLE

Pre PD dialysis:
- Take vital signs
- Weigh patient daily
- Measure abdominal girth.
- Warm the prescribed dialysate solution to body temperature.
- During instillation observe for any distress (Dyspnea, tachypnea,..)
- After prescribed dwell time, you drain the solution by gravity.
- Measure and record amount of drained fluid.
- Handle PD catheter in a sterile way. IT IS A LIFE TIME LINE

Post PD:
- Assess vital signs
- Education about diet.
- Involve patient with the treatment steps. Mainly aseptic techniques
DIALYSIS

HEMODIALYSIS  PERITONEAL-(PD)

FISTULA
Connecting an artery and a vein in your arm. *Can take up to 3 months to be ready.*

4 Hours 3x/week

Help reduce the risk to your kidneys

GET INVOLVED
REFERENCES:

- http://www.Fistula first .org
Thank you