

PRINCIPLES OF PERITONEAL DIALYSIS

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DEFINITIONS

- **C** : Continuous ; working all the time
- **A** : Ambulatory ; no ties to hospital, machines etc.
- **P** : Peritoneal ; where the dialysis actually takes place
- **D** : Dialysis

REMOVAL OF SOLUTES BY DIFFUSION

- **DIFFUSION** : The movement of molecules from a high concentration to a low concentration across a **semi-permeable** membrane. This is how waste material is removed.
- The blood in the capillaries have a high concentration of waste molecules ; the PD fluid has little or none.

REMOVAL OF FLUID BY OSMOSIS

- The movement of fluid across a semi-permeable membrane with the use of an osmotic agent.
- Glucose is a very strong osmotic agent and the more glucose present the more fluid will be removed. This is how excess fluid is removed from the patients blood.

THE PERITONEAL MEMBRANE

- Semi- permeable natural membrane in the abdomen
- Lines the intestine
- Forms a convoluted “bag” with a space in the middle for the tip of the tube
- Approx 1-2m surface area
- Large capillary bed for removal of waste

STANDARD PD FLUID

- Sterile water
- Sodium, magnesium, lactate
- Calcium (PD1=1.75mmols /PD4=1.25mmols)
- Glucose (1.36%, 2.27%, 3.86%)
- Volume used influences dialysis dose
- 1500ml, 2000ml, 2500mls

BUFFERS

- Lactate ions in standard PD fluid move across into patients blood. Metabolised by the liver to release bicarbonate ions that will soak up excess hydrogen ions.

OSMOTIC AGENTS

- Glucose : Different strengths used depending on amount of fluid to be removed.
- Patient can absorb the glucose into their blood. Glucose absorption leads to weight gain and loss of appetite.
- Always strive to keep glucose load to minimum.

SPECIAL FLUIDS

- **EXTRANEAL** : Glucose polymers. Exerts osmotic pressure without glucose being absorbed. Only used for long dwell.
- **NUTRANEAL** : No glucose. Rich in amino acids. No osmotic pressure. Only one bag a day
- **PHYSIONEAL** : Bicarbonate rich fluid. Unstable hence 2 pouch bag. Biocompatible

PD.... THE GOOD & THE BAD

- CONSTANT
- GENTLE
- BETTER BP CONTROL
- LESS FLUID RESTRICTIONS
- INDEPENDENCE
- CONTROL
- EVERY DAY
- RISK OF INFECTION
- WEIGHT GAIN
- BODY IMAGE

PATIENT SELECTION

- TREATMENT OF CHOICE FOR PATIENTS WITH DIABETES
- MOTIVATION
- STORAGE
- PERSONAL HYGEINE
- HOME ENVIRONMENT
- MANNUAL DEXTERITY

COMPLICATIONS

- Infection
- Loss of ultrafiltration due to sclerosis
- Hernias
- Weight gain
- Sclerosing peritonitis

AUTOMATED PERITONEAL DIALYSIS

- Machine that does fluid changes for patient
- Prescriptive treatment
- Socially more acceptable
- Better dialysis
- Less risk of infection

PD TUBE EXIT SITE CARE

- Leave for 1 week post insertion
- Clean 3 times a week with Iodine antiseptic lotion
- Tape to skin before covering with dressing
- Bacteroban ointment topically
- Bring tube out to the side of the dressing

EXIT SITE INFECTION

- Red, sore, pus oozing = infection
- Swab and send for C&S
- C/O Oral flucloxacillin 500mg QDS
- Clean daily until infection resolves

SYMPTOMS OF PERITONITIS

- Abdominal pain
- Nausea and vomiting
- Diarrhoea
- Cloudy dialysate

TREATMENT FOR PERITONITIS

- Ask patient to come to Unit IMMEDIATELY, bringing used bag of PD fluid
 - Basic observations, Wt, BP Temp
 - Take 3 x 20ml samples of PD fluid for M C&S
 - Swab PD exit site
 - Perform PD set change
 - C/O IP Vancomycin & oral ciprofloxacin & heparin
- Inform CAPD Nurses