

CONTINUOUS AMBULATORY PERITONEAL DIALYSIS (CAPD) IN CHILDREN


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HOW IT ALL STARTED?

- ❑ 11 months old male infant.
- ❑ H/O poor urinary stream since birth.
- ❑ Admitted with Fever, irritability, dysuria
- ❑ Voiding urine adequately (2ml/kg/hour) - after admission
- ❑ USG abdomen – B/L Hydroureteronephrosis (RK- 7.3 cm, LK – 6cm), multiple echoes in pelvicalyceal system, distended bladder.

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- Blood culture – E. coli.
 - Urine culture – sterile (Taken after starting antibiotics)

RENAL PARAMETERS...

- Urea: 82 mg/dl
- Creatinine: 3.4 mg/dl
- eGFR: 11.1 ml/min
- K⁺ : 5 meq/L
- HCo₃: 6 meq/L
- Po₄: 7.7 mg/dl
- iCa⁺: 1.45
- Hb%: 9.4
- iPTH: 202

WORKING DIAGNOSIS...

- Posterior urethral valve (PUV)
- Urosepsis
- CKD (stage 5) - ESRD (eGFR <15ml/min)

TREATMENT

- Ceftriaxone.
- Medical measures for hypertension and dyselectrolytemia started.
- Serum creatinine continued to rise.

RENAL REPLACEMENT THERAPY

- Acute peritoneal dialysis started on D3 of hospitalization.
- **Response** – better control of dyselectrolytemia and decrease in serum creatinine levels to 3.7.
- PD catheter got blocked after 3 days and had to be removed.
- Serum creatinine started rising again.

NEED FOR CAPD

- Parents told about the need for CAPD.
- CAPD catheter inserted with the help of surgical team.
- CAPD started 10 days later.
- Gradually technique of CAPD taught to family.



SUPPORTIVE MEASURES...

- Sodium bicarbonate.
- Phosphate binders.
- Vitamin D.
- Erythropoietin.
- Iron.
- Anti – hypertensives.
- Uroprophylaxis.

SUBSEQUENT INTERVENTION

- MCU – trabeculated bladder S/O PUV.
- Cystourethroscopy with PUV fulguration.

ON FOLLOW UP....

- Growing satisfactorily
- Achieving age appropriate milestones
- Electrolyte levels have stabilized
- Blood pressure under control





2nd CASE....

- 2 ½ years old female child
- Diagnosed at 10 months of age with LV non compaction
- On anti – failure measures

BROUGHT WITH....

- Short febrile illness with diarrhea
- Fast breathing – Acidotic
- Pallor
- Failure to thrive – wt 8 kg
- Hypertension

RENAL PARAMETERS...

- Urea: 212 mg/dl
- Creatinine: 4.5 mg/dl
- eGFR: 9.6 ml/min
- K⁺: 4.5 meq/L
- Hco₃: 3 meq/L
- Po₄: 10.5 mg/dl
- i.Ca: 0.65 mmol/L
- Hb%: 5.3 gm/dl

USG ABDOMEN....

- B/L nephromegaly (RK- 10.8cm, LK – 10.6 cm)
- Loss of cortico-medullary differentiation
- Coarse parenchymal echo texture of liver

DIAGNOSIS....

- Autosomal recessive Polycystic kidney disease.
- Congenital hepatic fibrosis.
- CKD – stage 5.

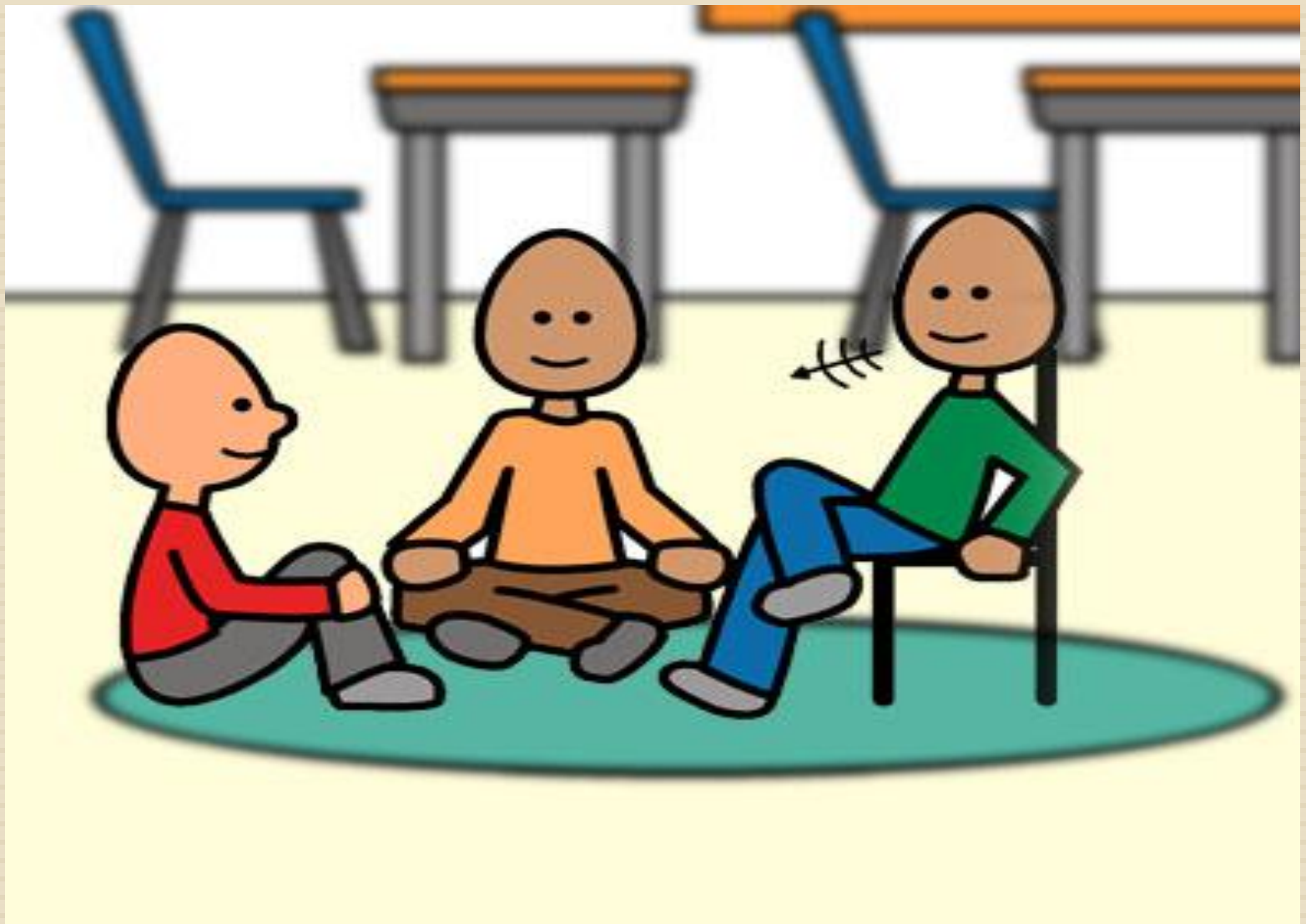
TREATMENT

- Acute peritoneal dialysis started.
- Supportive measures continued.
- eGFR improved to 19ml/min.

FURTHER COURSE....

- Parents told about the nature of child's illness and the need for long term renal replacement therapy.
- Parents wanted time to get ready for CAPD.
- Discharged.

DISCUSSION....



HISTORY....

- 1923 – Peritoneal cavity first used for dialysis in guinea pigs.
- 1961 – Boen described intermittent peritoneal dialysis (IPD).
- 1976 – Popovich et al described CAPD.
- 1981 – Diaz buxo started CCPD.

PERITONEAL DIALYSIS.

- Intracorporeal dialysis.
- Heart – blood pump.
- Peritoneum – dialyzer.

NECESSITIES....

- A healthy peritoneal cavity lined by a functional membrane.
- Approx S.A – equal to skin.
- Blood supply – 60-70 ml/min.
- An indwelling catheter placed in the peritoneal cavity.
- Dialysis fluid with a delivery system.

PRINCIPLES....

- Diffusion.
- Osmosis/ Ultra filtration.

DIFFUSION

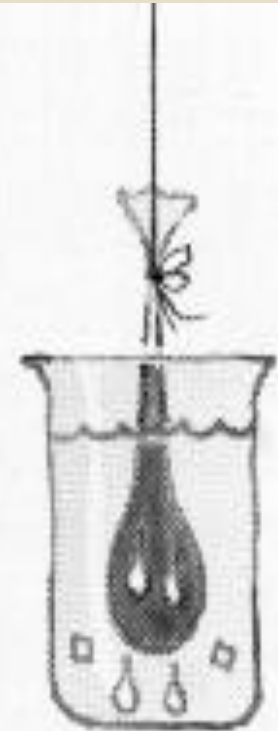


DIALYSATE
WITH SUGAR



BLOOD

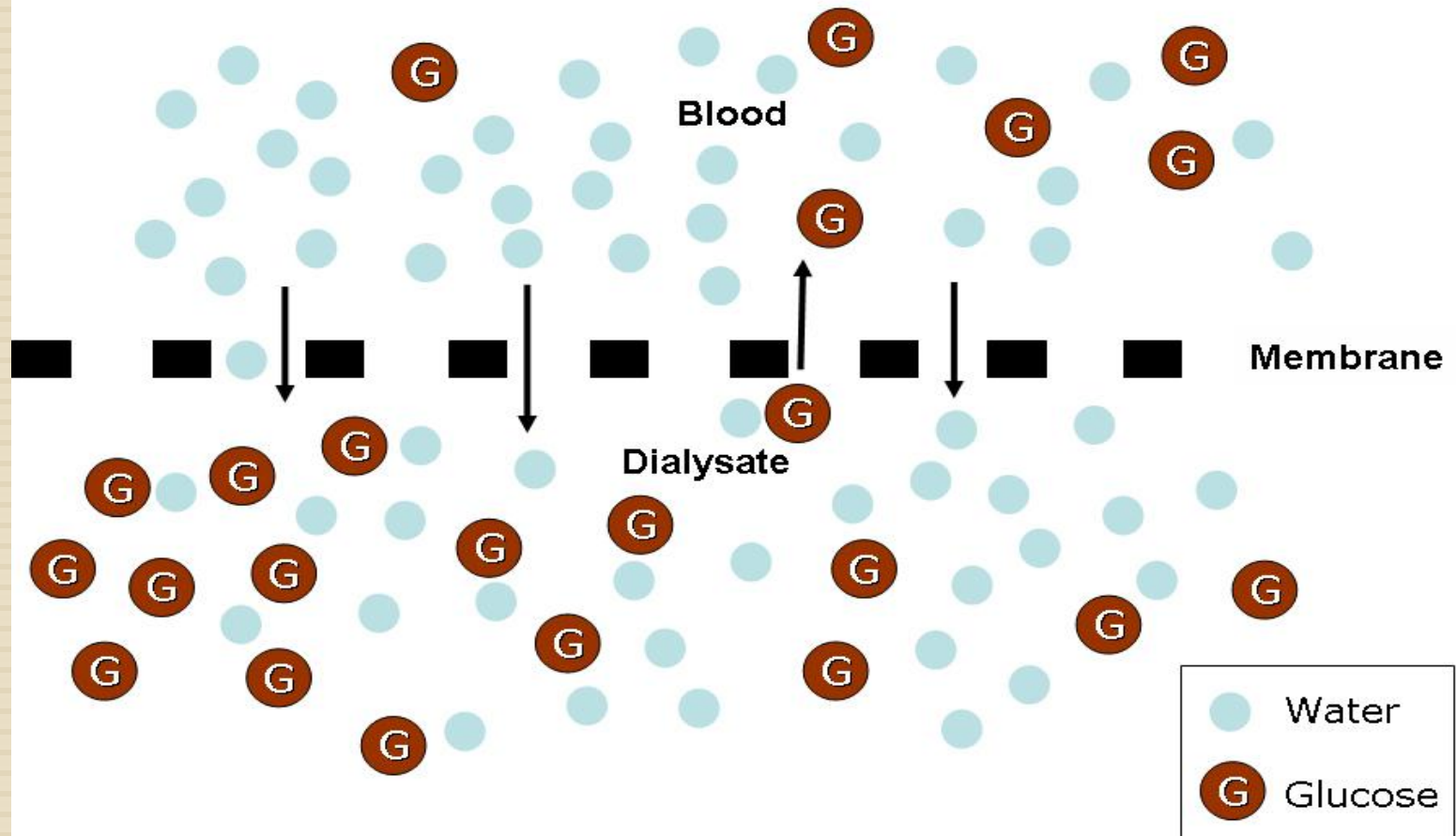
WATER



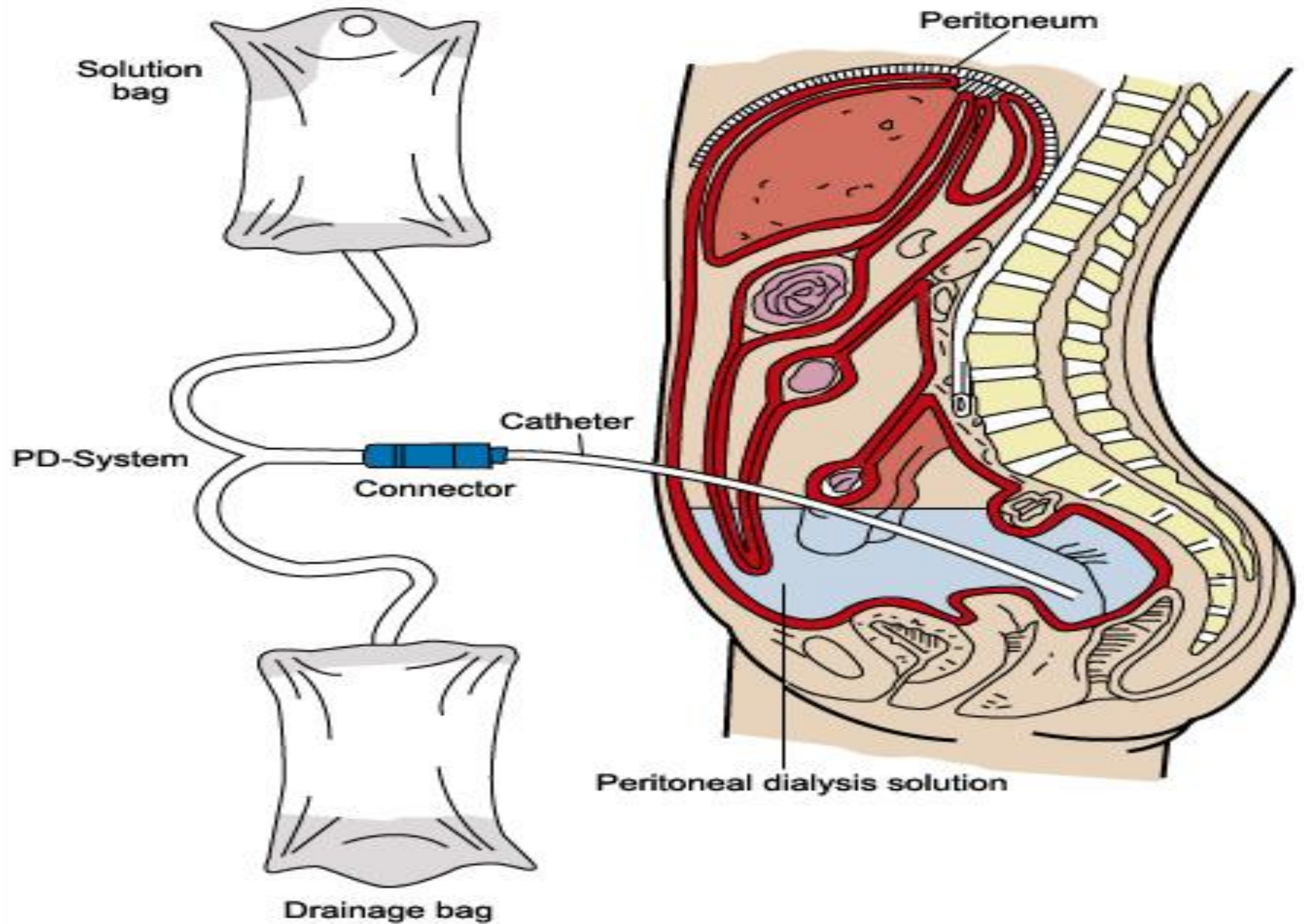
AN EQUAL AMOUNT
PASSES THROUGH
AS REMAINS

OSMOSIS

Osmosis with glucose



Principle of Peritoneal Dialysis



TECHNIQUE....

- CAPD – 4-6 exchanges per day.
- Remains a closed circuit and done under strict aseptic precautions

IN CHILDREN.....

Preferred over hemodialysis as:

- Reduces number of hospital visits and cost

- Avoids the problems of
 - vascular access
 - anticoagulation
 - hemodynamic disturbance.

LITERATURE....

- Well established for adults with ESRD
- Experience with infants and young children is limited so far.
- Continuous peritoneal dialysis in children: a single-centre experience in a developing country.
1994 -2004 SGPIMS, Lucknow.
- Youngest – 5 years

TAKE HOME MESSAGE....

- CAPD is a viable option for dialysis in ESRD children in a developing country.
- Can be used as a successful bridge between ESRD and renal transplantation.

ACKNOWLEDGEMENTS





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