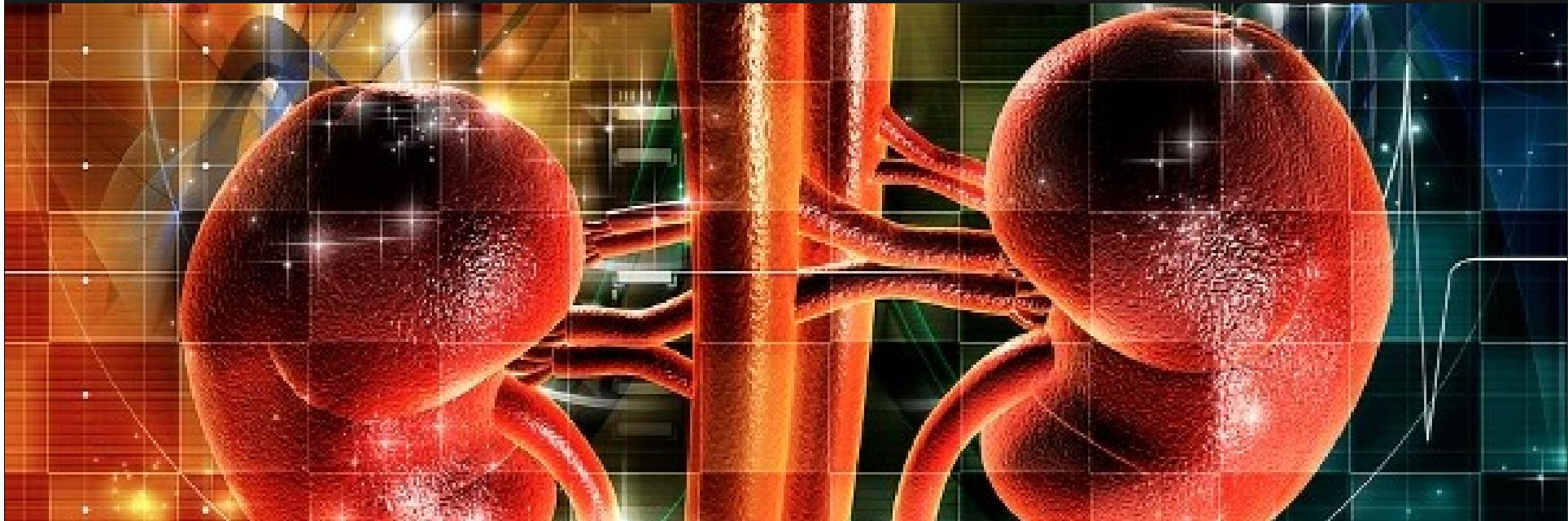


ACUTE PERITONEAL DIALYSIS SOMETIMES SIMPLE IS THE BEST...



KONGGRAPUN SRISUWAN, MD

NEPHROLOGY DIVISION, DIALYSIS and TRANSPLANTATION PROGRAM
DEPARTMENT of PEDIATRICS, PHRAMONGKUTKLAO HOSPITAL

SCOPE

- Principle and concept of acute peritoneal dialysis (APD)
- Indication and contraindication
- PD catheters
- Dialysis setups
- PD solution
- APD prescription in AKI
- Complications of APD
- Outcome of APD in AKI

WHY PEDIATRICIAN SHOULD KNOW ABOUT APD?

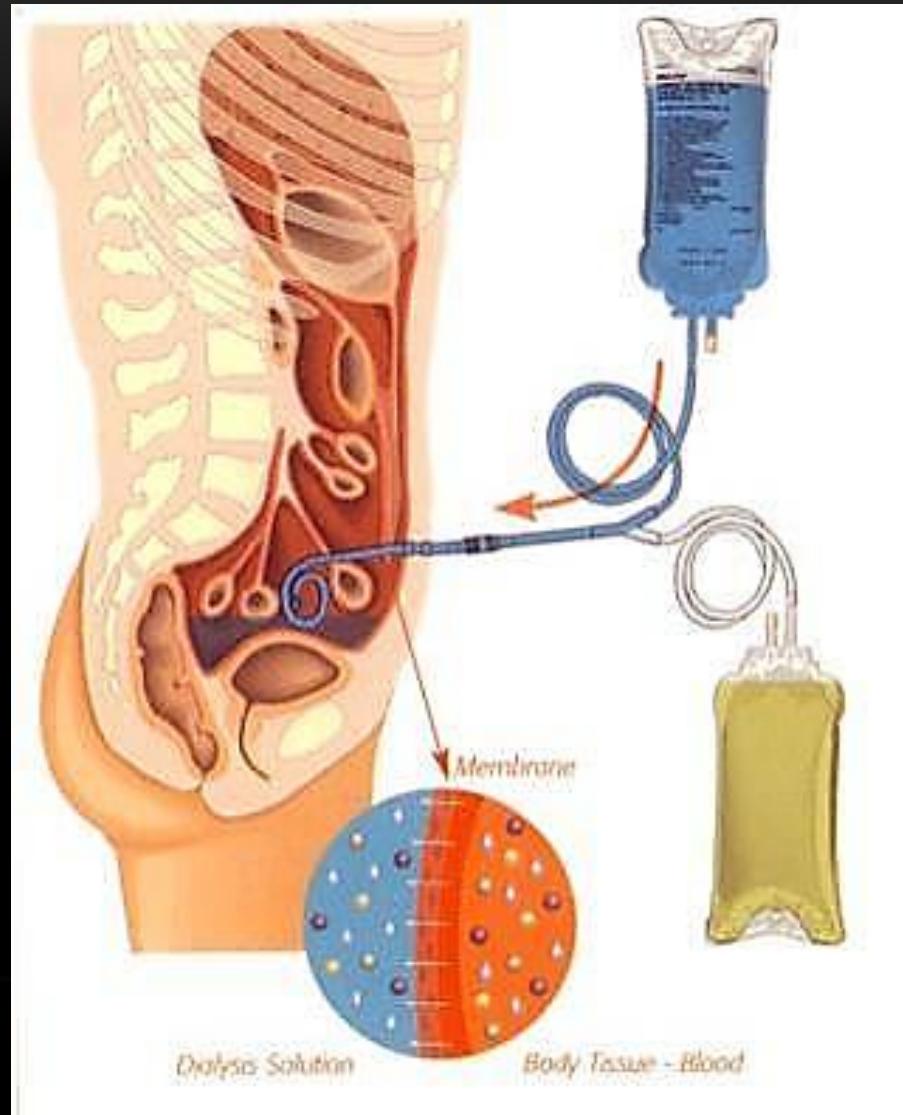
- PD is the simplest and most popular mode of renal replacement therapy (RRT) for children
- PD may be the only one choice for patient!



ADVANTAGES OF APD

- RRT in the treatment of AKI in small children
- Hemodynamically unstable patients
- The presence of bleeding diathesis or hemorrhagic conditions, C/I for anticoagulation
- Patients with difficult vascular access placement
- Removal of high MW toxins (>10 kD)
- Continuous therapy

WHAT IS PERITONEAL DIALYSIS ?

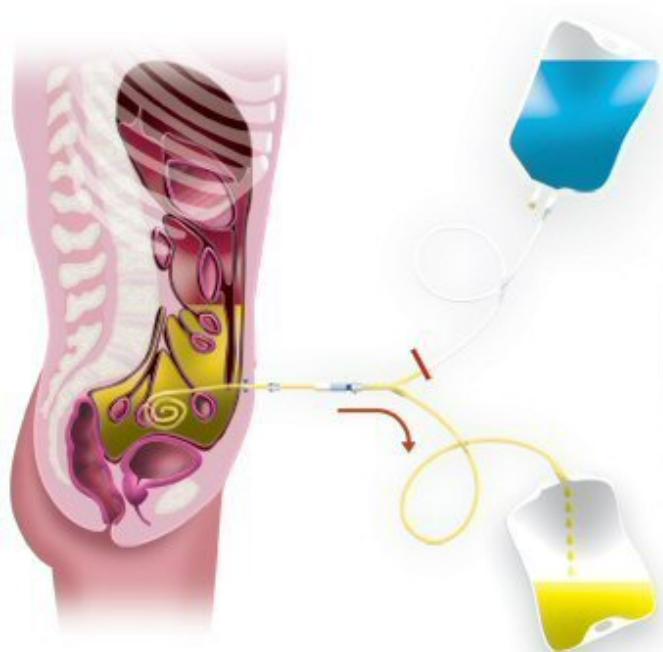


glucose, Na, Cl, Ca,
buffer

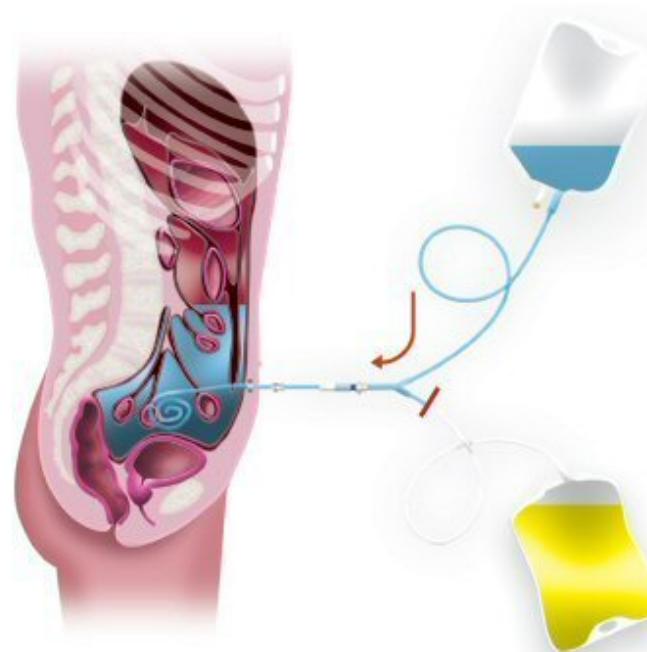


water, K, urea, other
uremic toxins

PD Exchange



DRAIN



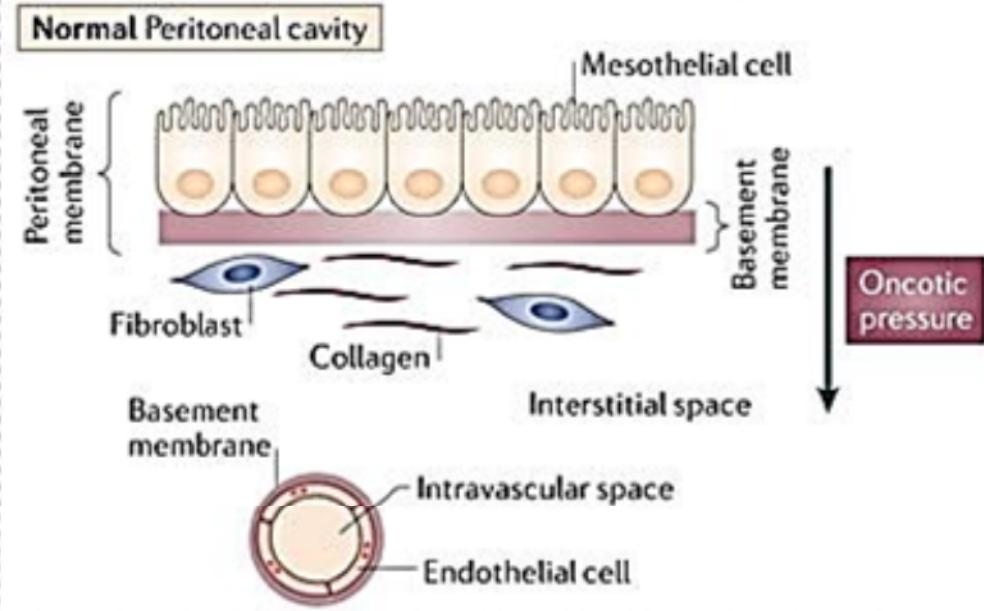
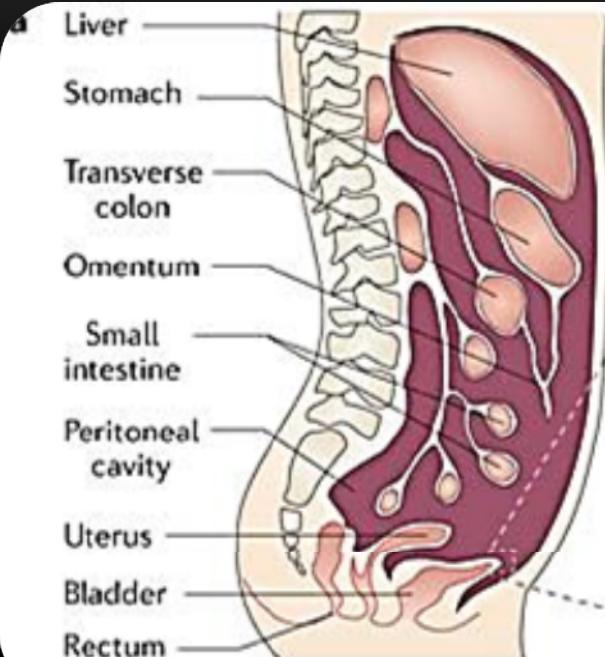
FILL

Does not require
the use of blood
to leave your body

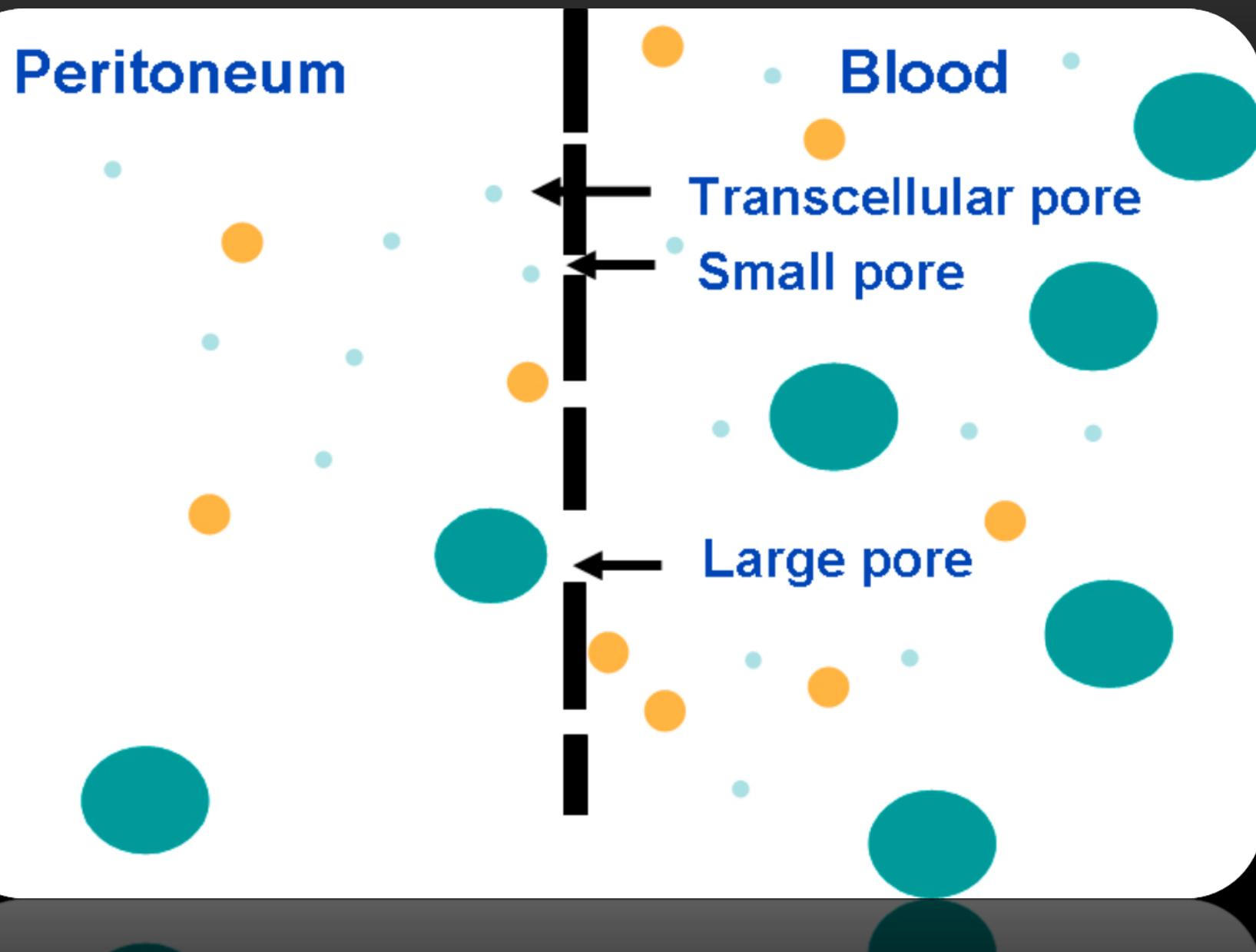


DWELL

ANATOMY AND LAYERS OF PERITONEAL MEMBRANE

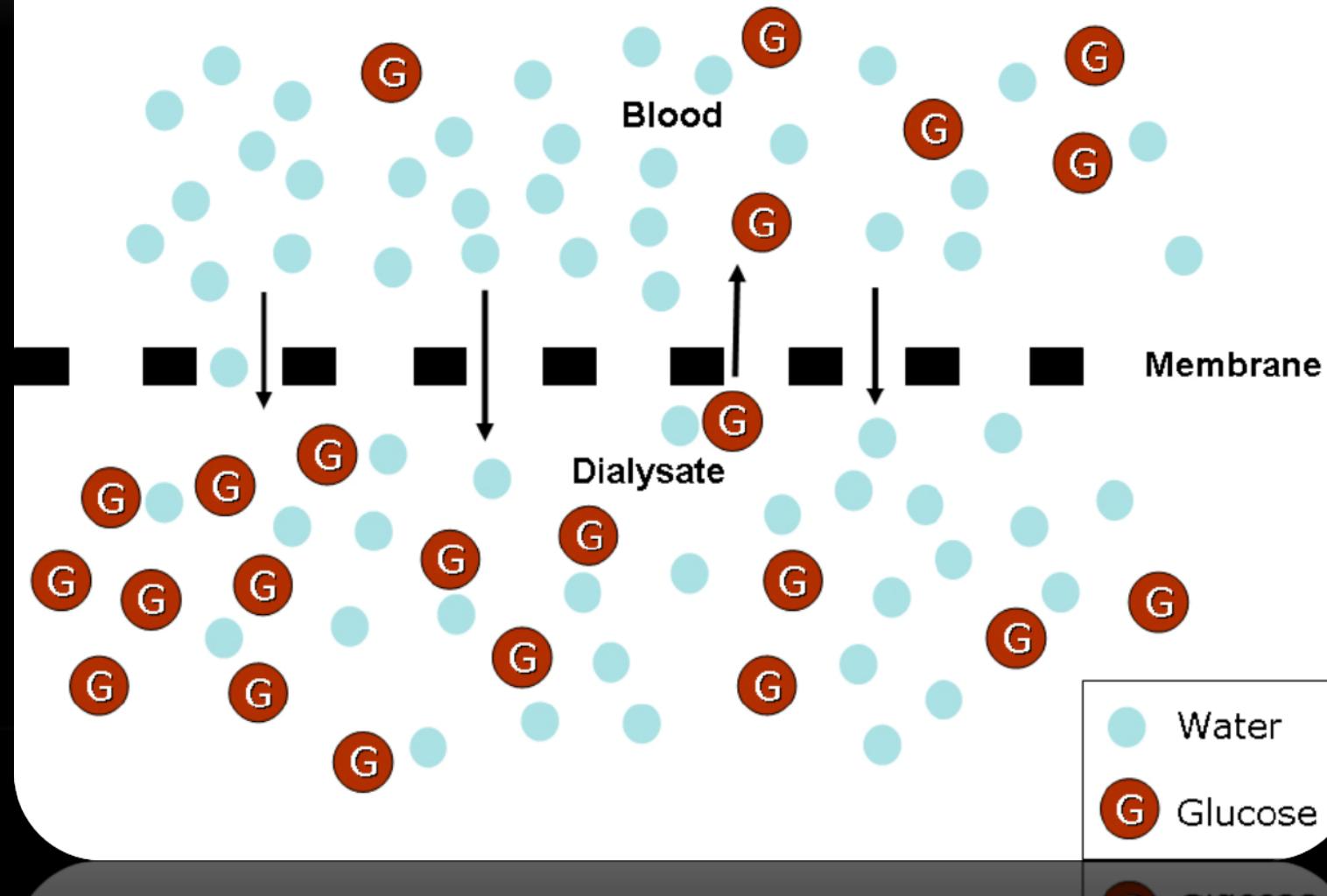


3 PORES MODEL : DIFFUSION



CONVECTION : ULTRAFILTRATION

Osmosis with glucose



INDICATIONS

- Diuretic resistant volume overload
- Refractory hyperkalemia
- Severe intractable acidosis
- Intractable hypertension related to volume overload
- Need for nutrition in an oliguric/anuric patient
- Severe azotemia
- (hyperammonemia/metabolic disorder)

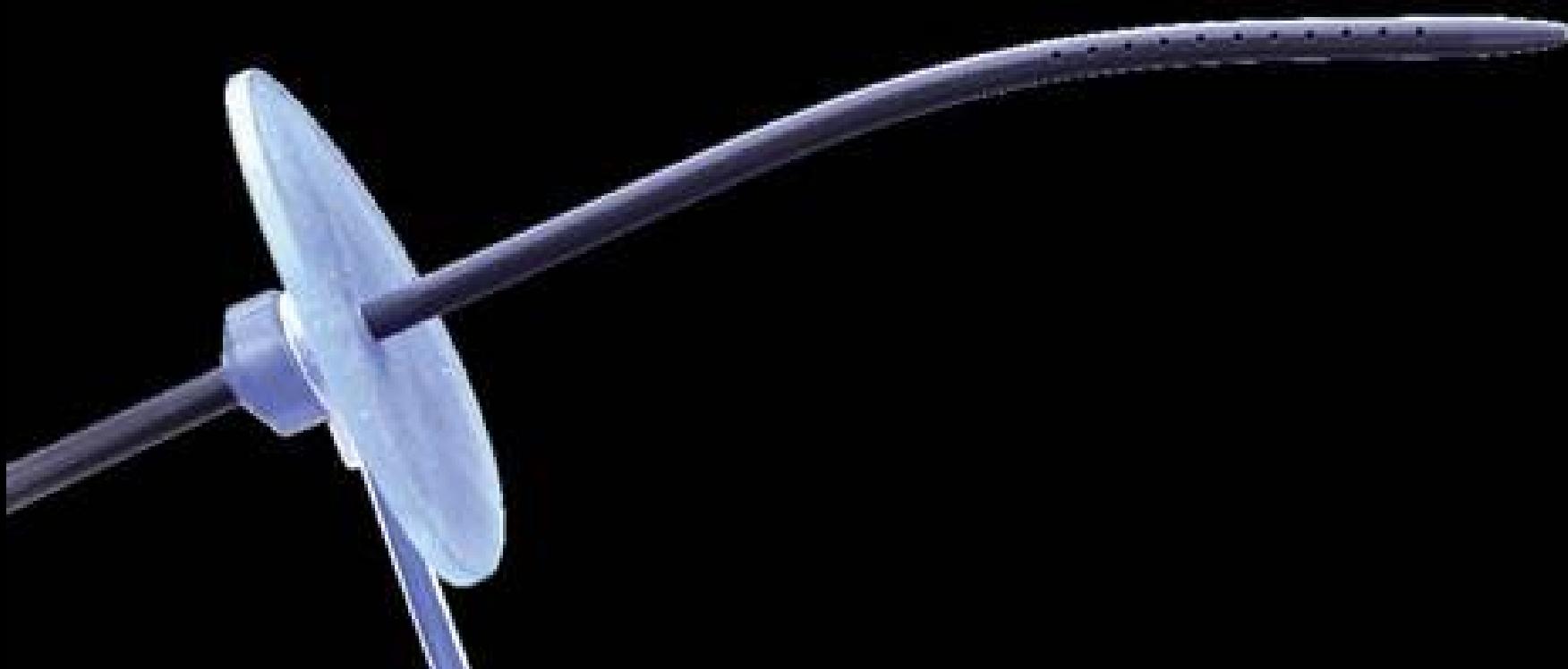
CONTRAINDICATIONS

- Omphalocele or gastrochisis
- Diaphragmatic hernia
- Bladder extrophy
- Fecal or fungal peritonitis
- Recent surgery require abdominal drains

RELATIVE CONTRAINDICATIONS

- Recent abdominal surgery
- Intra-abdominal malignancy
- V-P shunt
- Post-cardiac surgery
- Abdominal wall cellulitis
- Obliterated peritoneal cavity
- Inadequate dialysis surface

“ACUTE STAB” PD CATHETER TROCA CATHETER



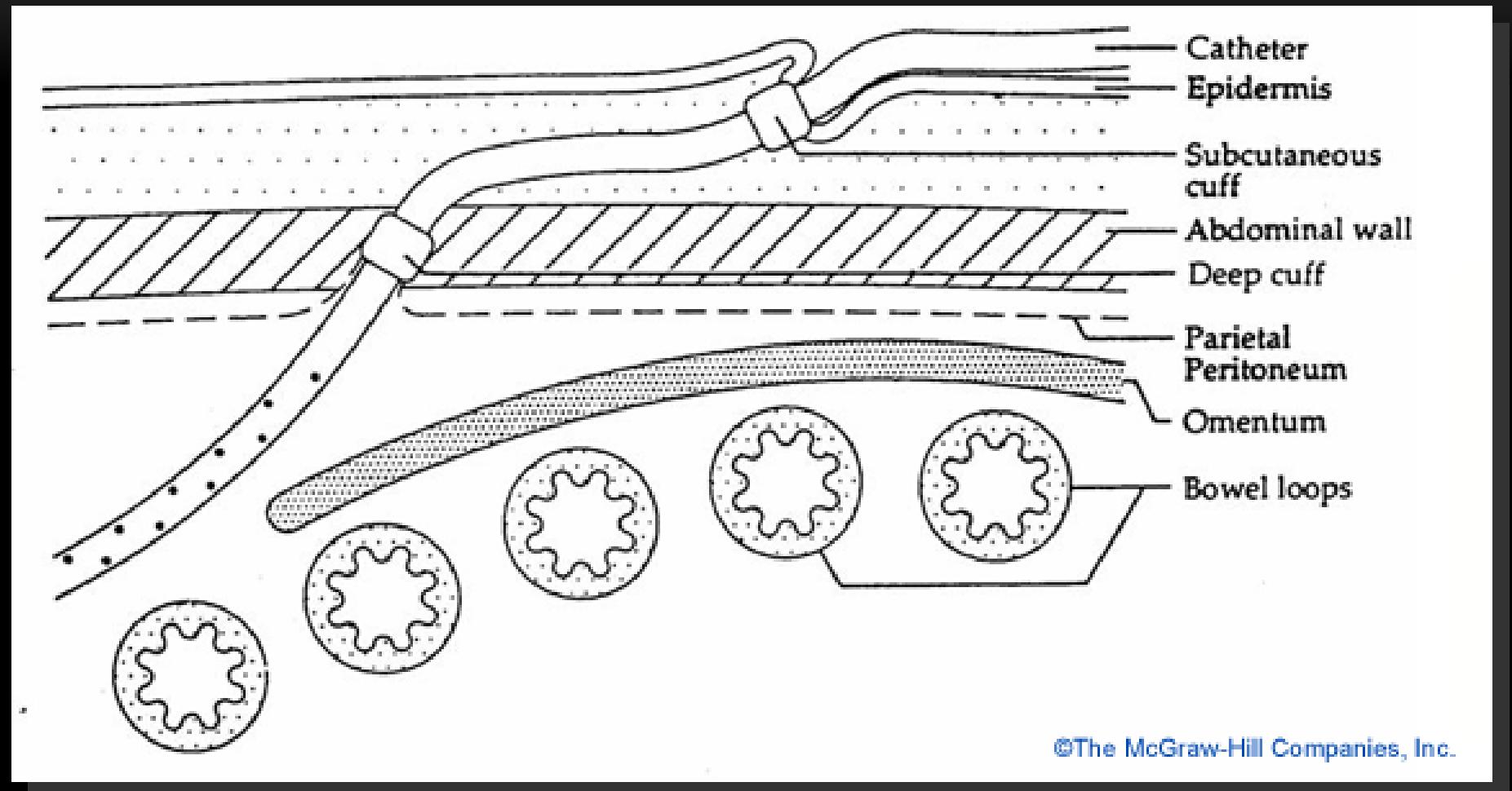
TENCKHOFF CATHETER



สายท่อล้างไตทางช่องท้องที่ใช้ในผู้ป่วยเด็ก โรงพยาบาลพระมงกุฎเกล้า

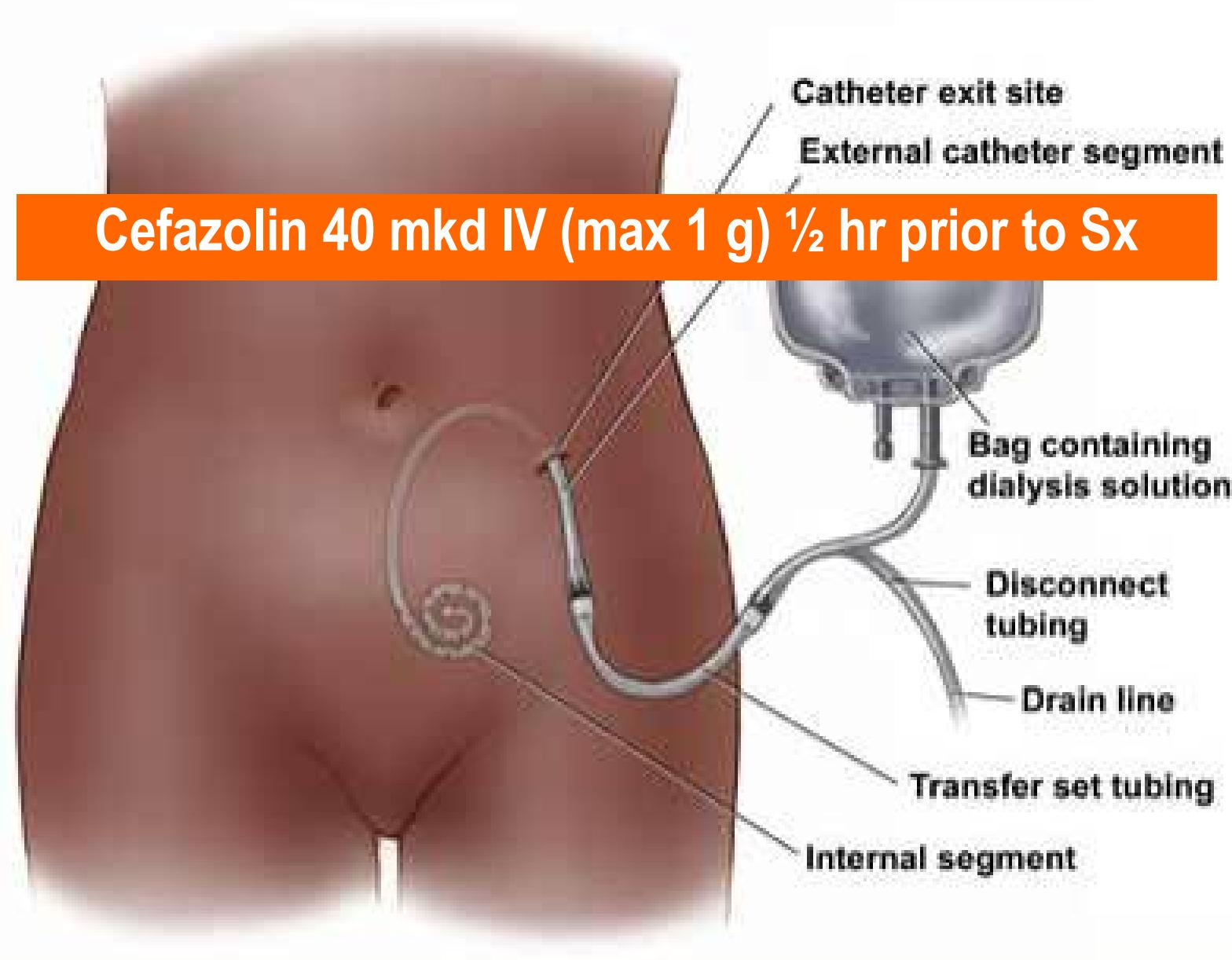
ชนิด	ลักษณะรูเปิดของสาย	จำนวน Cuff	ขนาดและความยาว
Neonate (medCOMP™)	Straight	1	15F/31 cm
Pediatric (KIMAL™)	Straight	2	32.25 cm
Pediatric (medCOMP™)	Coiled	1	15F/40.25 cm
Adult (Argyle™)	Curl	2	57 cm

2 CUFFS PD CATHETER



©The McGraw-Hill Companies, Inc.

Cefazolin 40 mkg IV (max 1 g) ½ hr prior to Sx





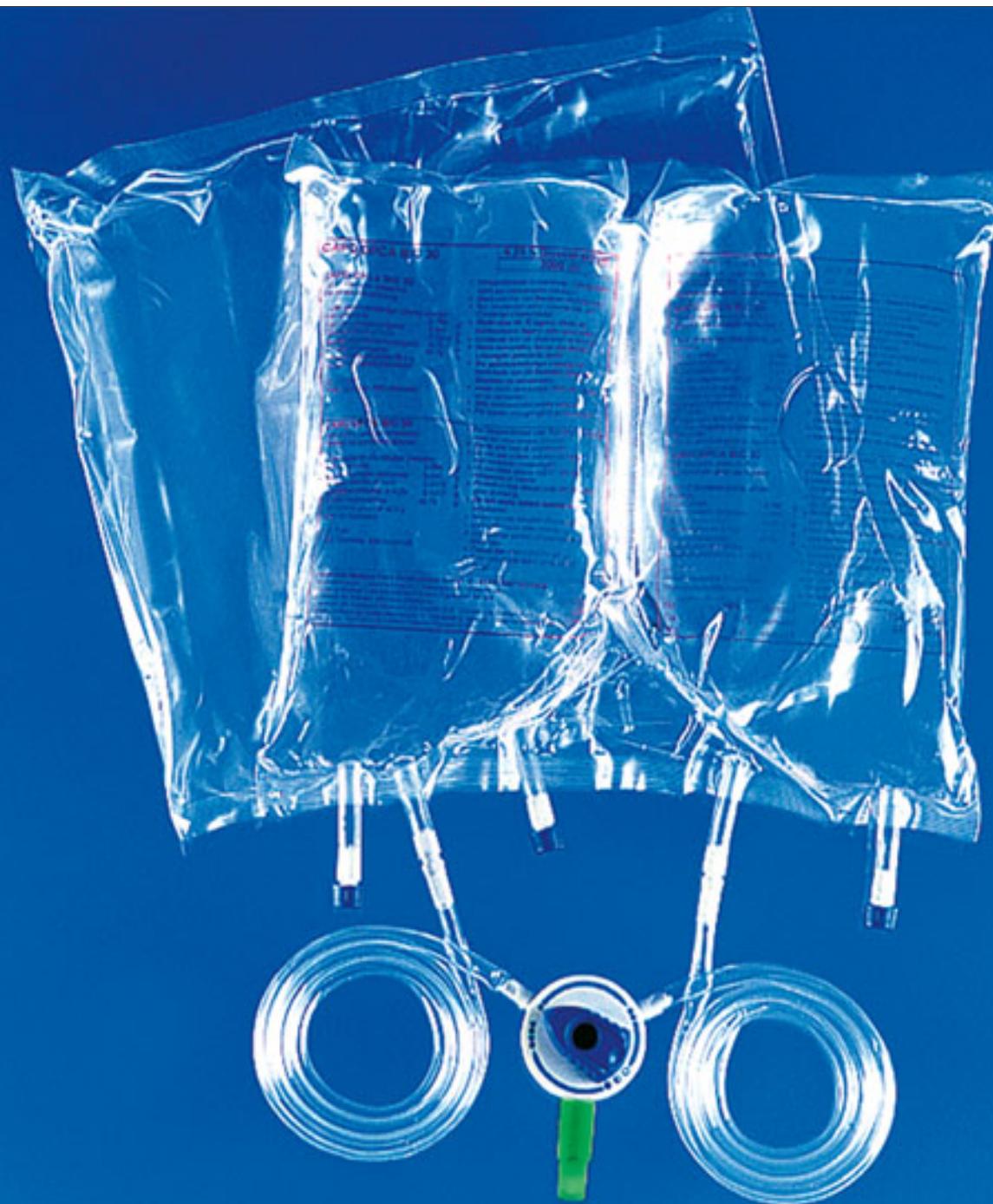
Good position

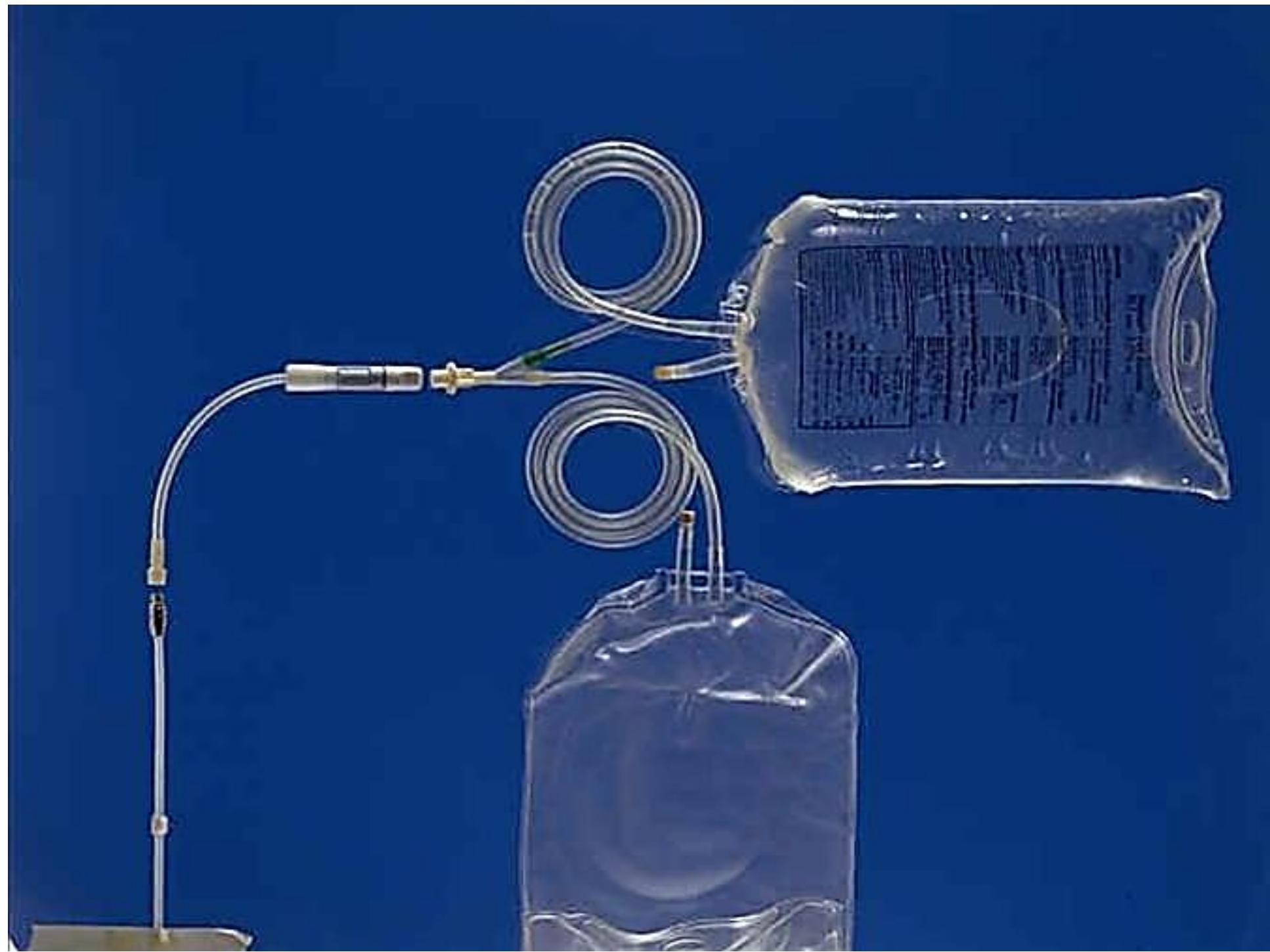
POST-OPERATIVE ABX AND HEPARIN

- Cefazolin 125 mg/L PD fluid only if leaking
- Heparin (500 U/L)
For first 3 days after catheter insertion

If fluid is cloudy or bloody

If fibrin are noted

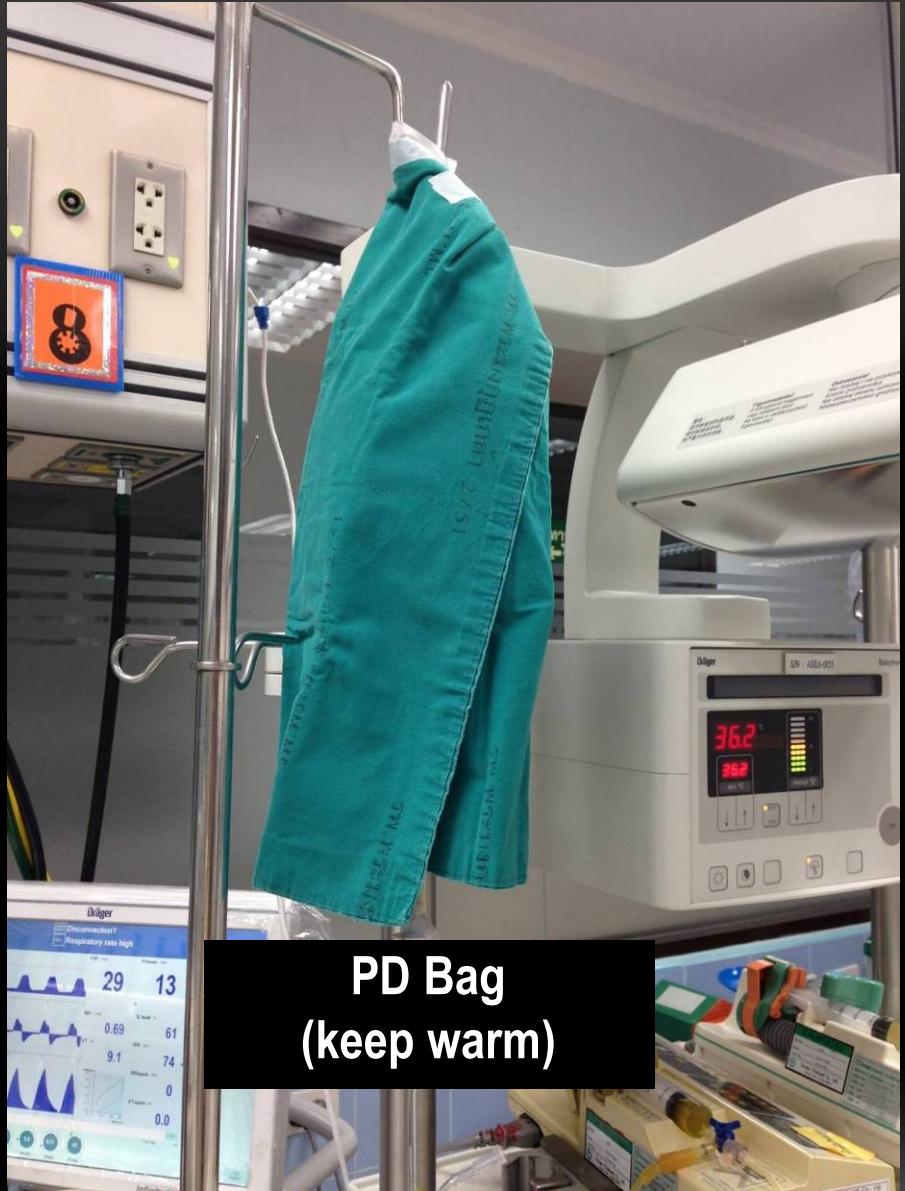




NEONATAL PD SET (PD-Peal SYSTEM)



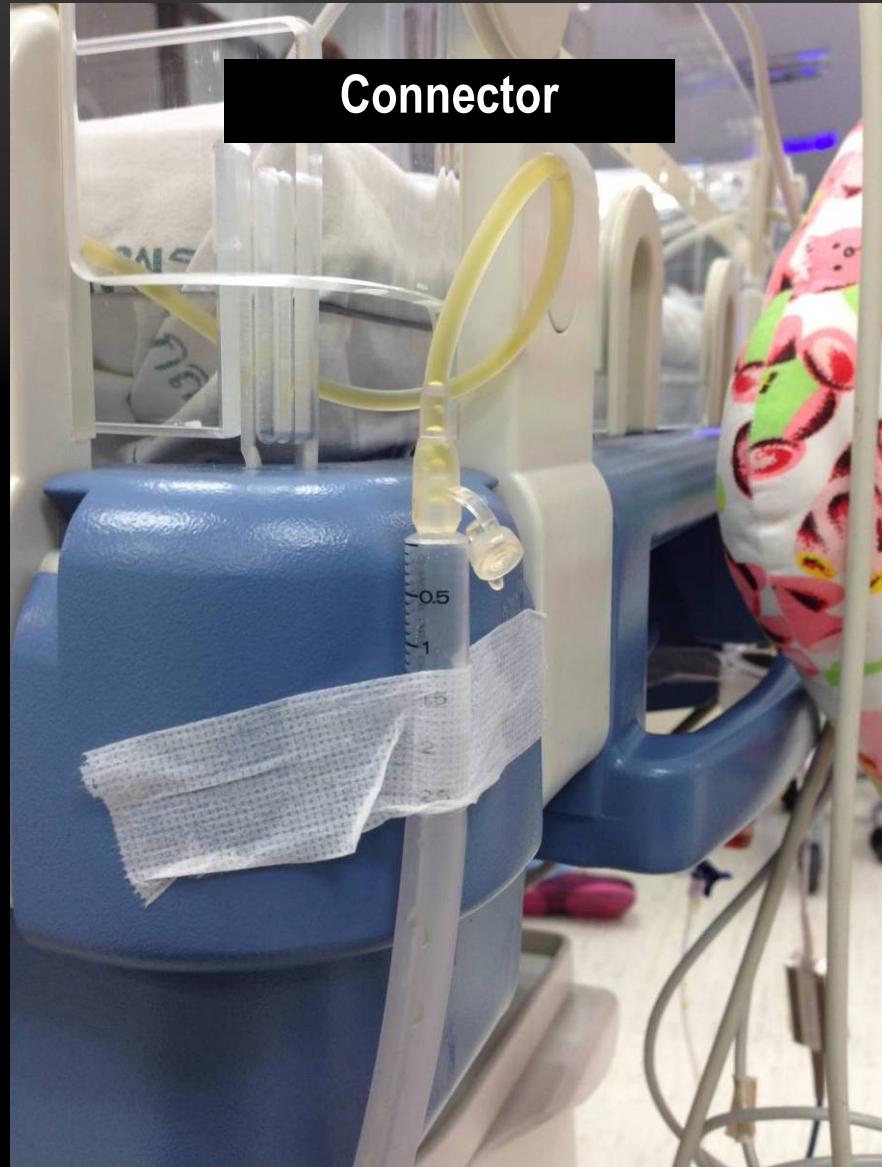




PD Bag
(keep warm)



Micro drip set



AUTOMATED PD (CYCLER)

Home Choice™



Sleepsafe™

PERITONEAL KINETICS

- Clearance

$$C = \frac{S_d \times Q_d}{S_p}$$

where

S_d = concentration of solute in dialysate

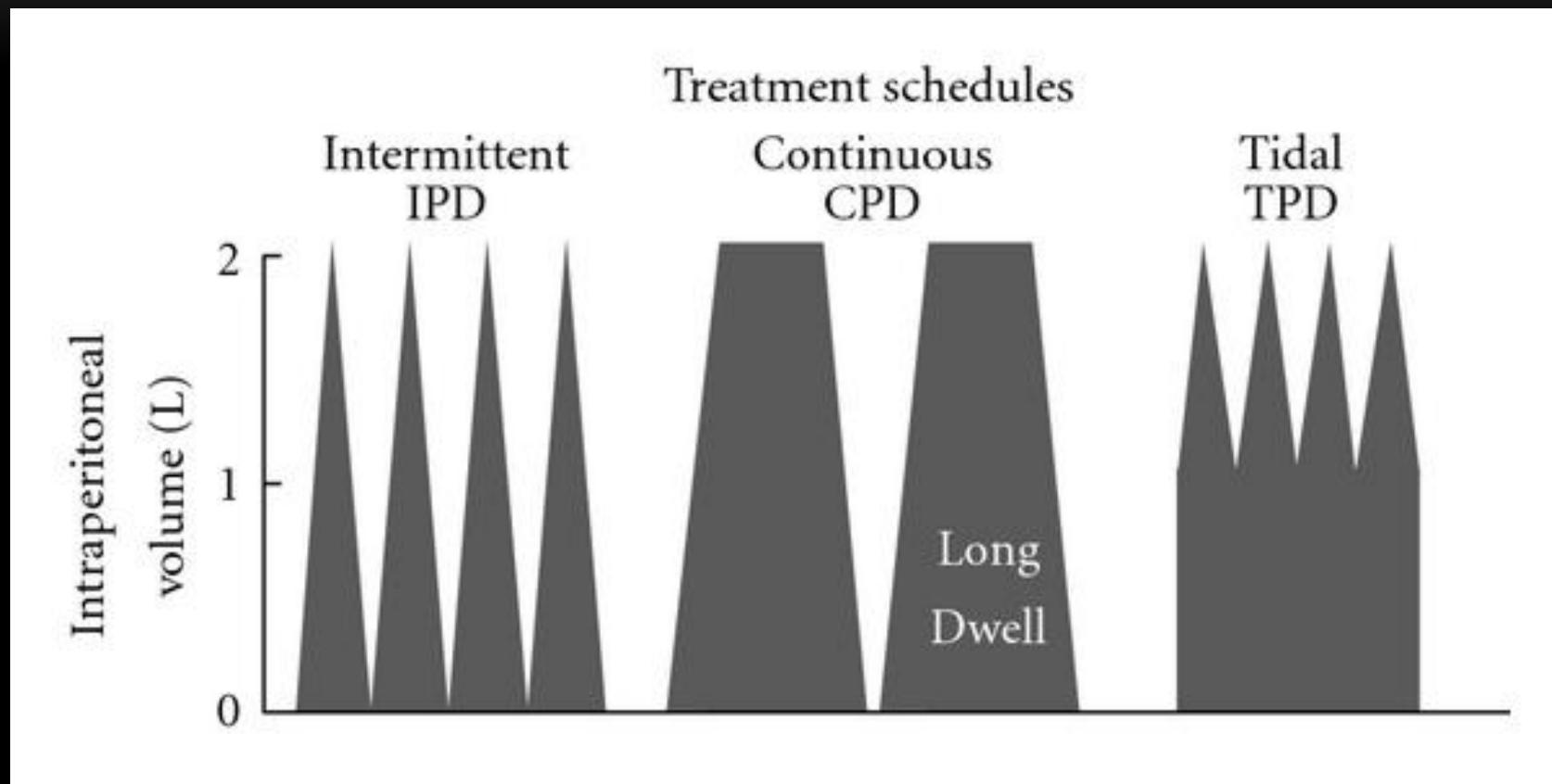
S_p = concentration of solute in plasma

Q_d = dialysate flow rate in ml/min

CLEARANCE

- S_d / S_p
 - reflects PD surface area and intrinsic peritoneal transport
 - influence by dwell time
- Q_d
 - mechanic of dialysis
 - volume per exchange
 - cycles per time interval
 - inflow, outflow and dwell

BASIC PERITONEAL DIALYSIS REGIMENS



PD FLUID COMPOSITION

Sodium	132 mmol/L
Potassium	0 mmol/L
Chloride	96 mmol/L
Calcium	1.25 and 1.75 mmol/L
Magnesium	0.25 mmol/L
Lactate	40 mmol/L, pH 5.2
Dextrose or Glucose	1.5, 2.5 and 4.25 g/dL 1.36, 2.27 and 3.86 g/dL

ULTRAFILTRATION

Dextrose (g/dL)	Glucose (g/dL)	Osmolarity (mOsm/L)	Ultrafiltration volume (mL/1 exchange over 1 hour)
1.5	27.2 g/ 2L	346	50-150 (2.5-7.5%)
2.5	45.4 g/ 2L	396	100-300 (5-15%)
4.25	77.2 g/ 2 L	485	300-400 (15-20%)

glucose varied on basis of need for UF

MECHANICS OF DIALYSIS

- Volume of PD fluid
 - 10-15 ml/kg to prevent leakage
 - increments of 2.5-5 ml/kg q 12-24 hr
 - Target of 30-50 ml/kg or 1100-1400 ml/m²
- * maximum 800 ml/m² for infant
- Intraperitoneal pressure monitoring is helpful

Maximum volume to achieve clearance but minimize risk to leak

INTRAPERITONEAL PRESSURE MEASUREMENT

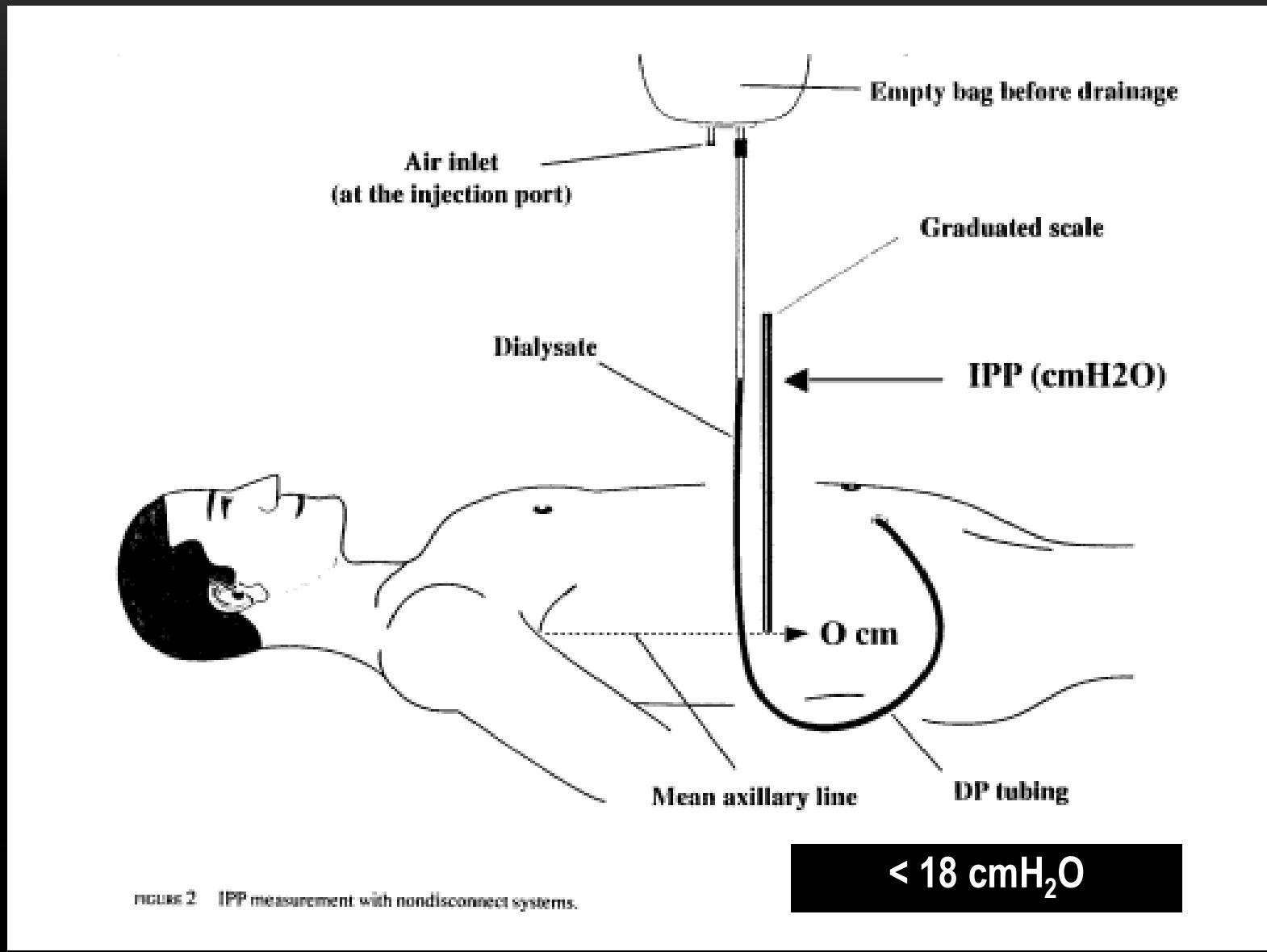
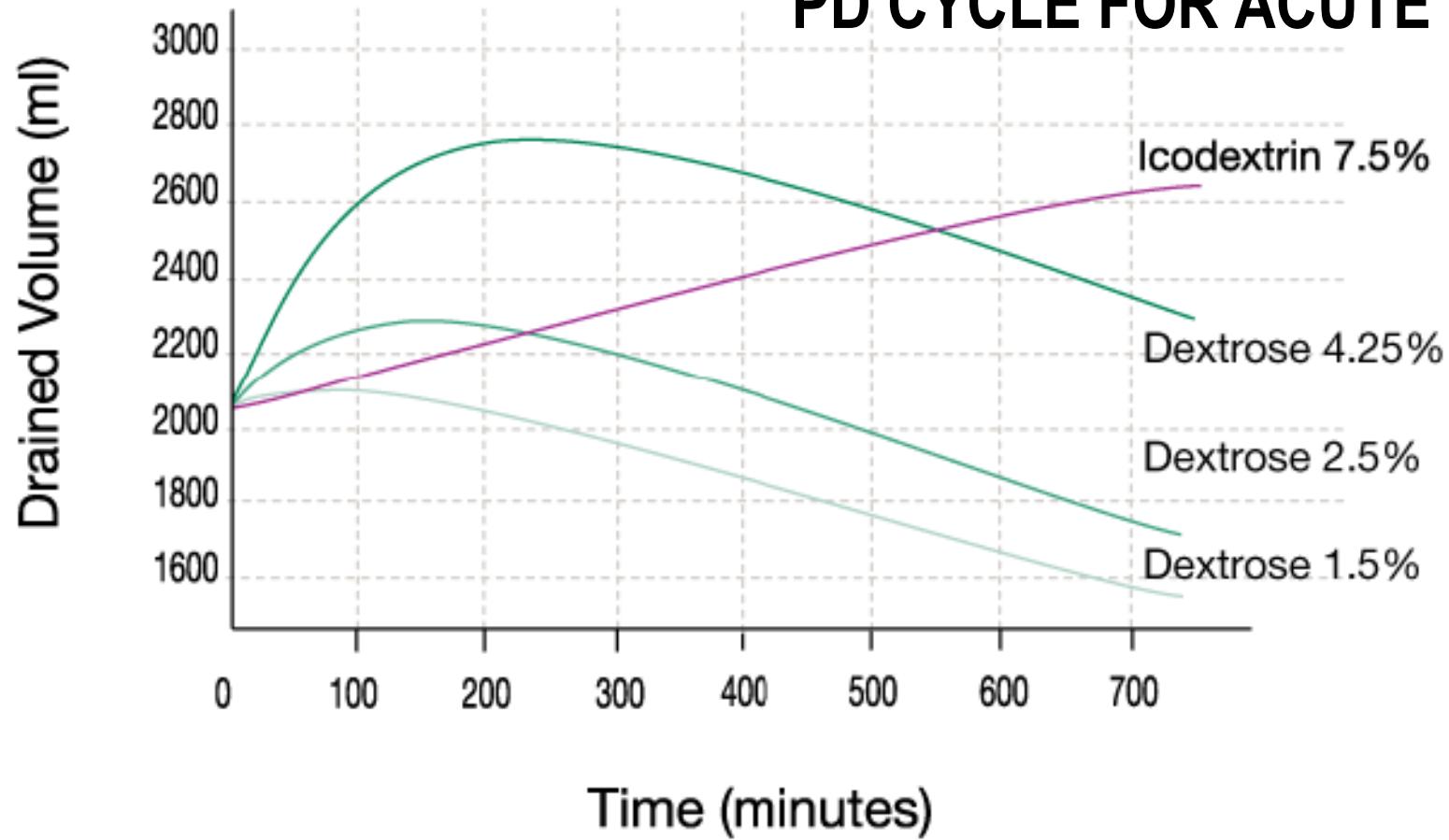


FIGURE 2 IPP measurement with nondisconnect systems.

Simulated UF profiles¹

PD CYCLE FOR ACUTE PD



- Standard: 1-2 hr/cycle (30-90 min. for dwell)
- Inflow 5-10 min. outflow 15-20 min.

Rippe, Kidney Int 1999

MEDICATIONS FOR IP ROUTE

- Antibiotics (ISPD guide line)
- Heparin (250-500 U/L)
- K (max 4 meq/L)



NB WITH EBSTEIN ANOMALY WITH SEPTIC AKI



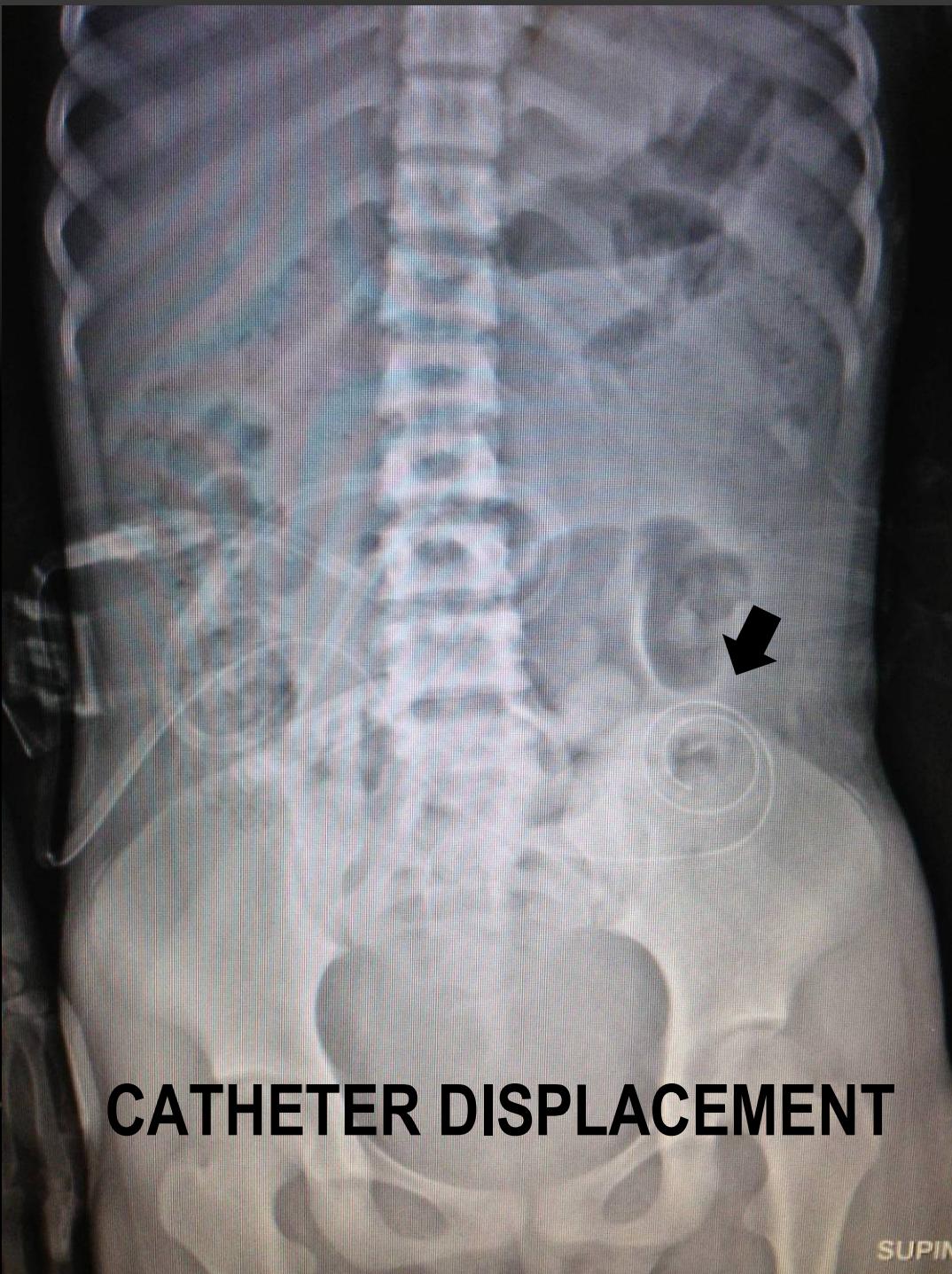
- 1 cycle/ hr
- Dwell time 40 min
- Inflow time 5 min
- Outflow time 15 min
- Fill volume 15 ml (10 ml/kg)
- 1.5% dextrose solution with Ca 1.75 mmol/L

NOTIFY MD IF...

- Fill time > 10 minutes
- Drain time > 20 minutes
- Effluent volume is < 90% of infused volume
- Effluent is cloudy
- Leakage at the catheter exit site or incision
- Increased leakage through chest tubes if present
- Fever
- Abdominal pain

COMPLICATIONS

- Cardiovascular instability
- Inadequate UF and clearance
- Hyperglycemia
- Lactic acidosis (lactate-based solution in liver failure)
- Catheter malfunction
- Hydrothorax
- Peritonitis
- Scrotal and labial edema



SUPIN

CATHETER OCCLUSION

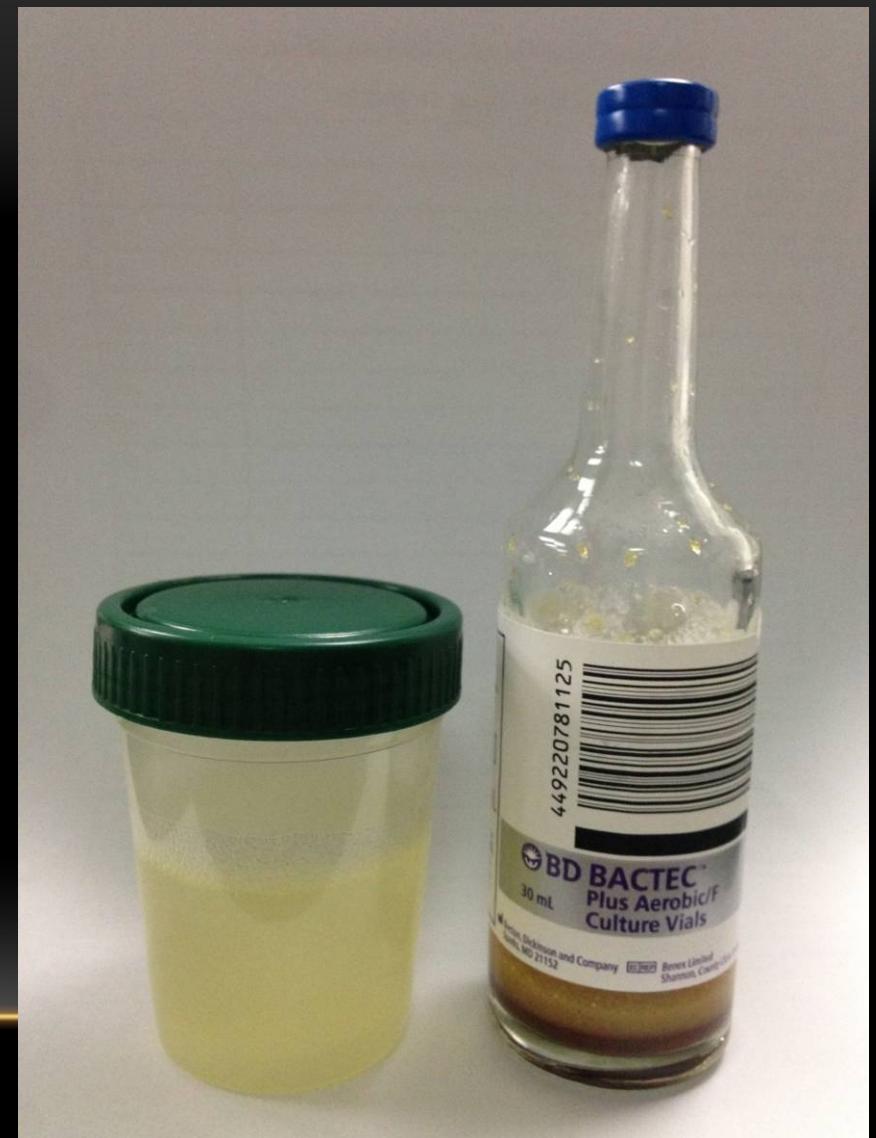
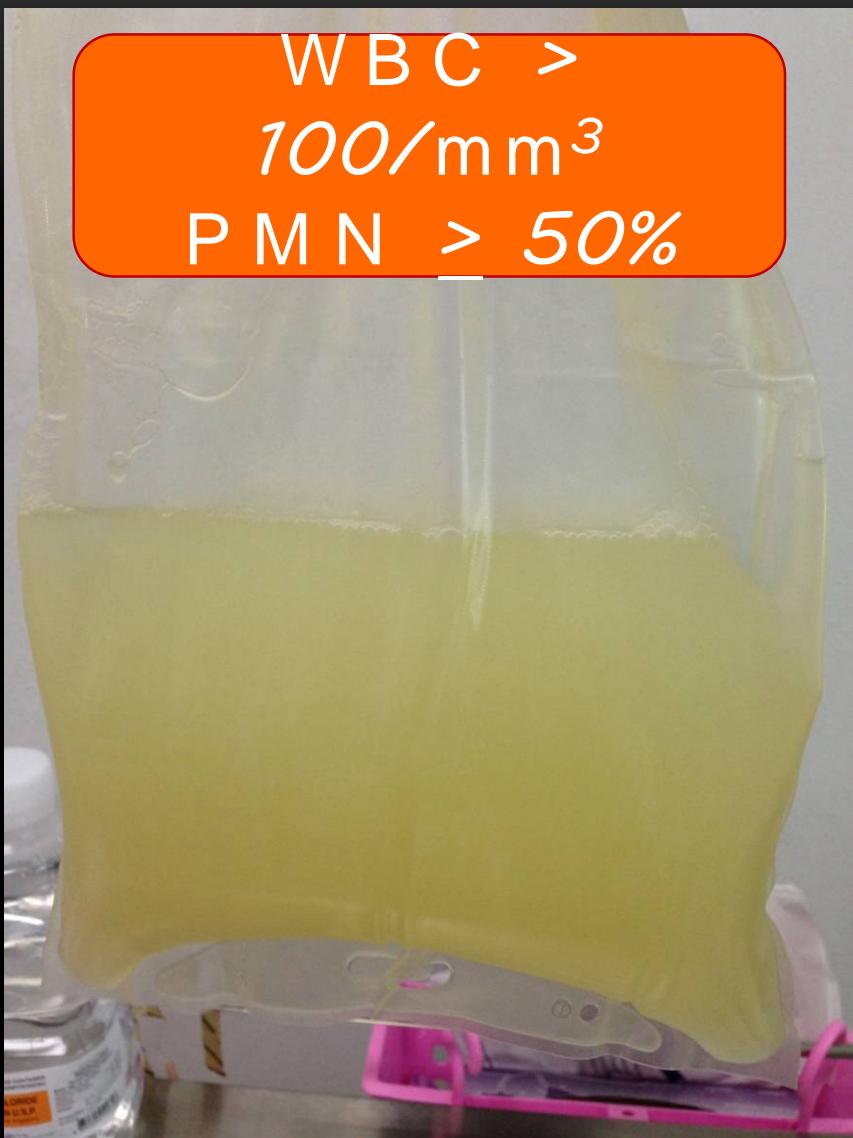
- Outflow failure : usually omentum
- Inflow failure : Clot or fibrins
- Alteplase (tPA) 1 mg/ml undiluted fills catheter (plus transfer set)

PD LEAKS / HERNIA



CLOUDY DIALYSATE FLUID / PERITONITIS

W B C >
 $100/\text{mm}^3$
P M N > 50%



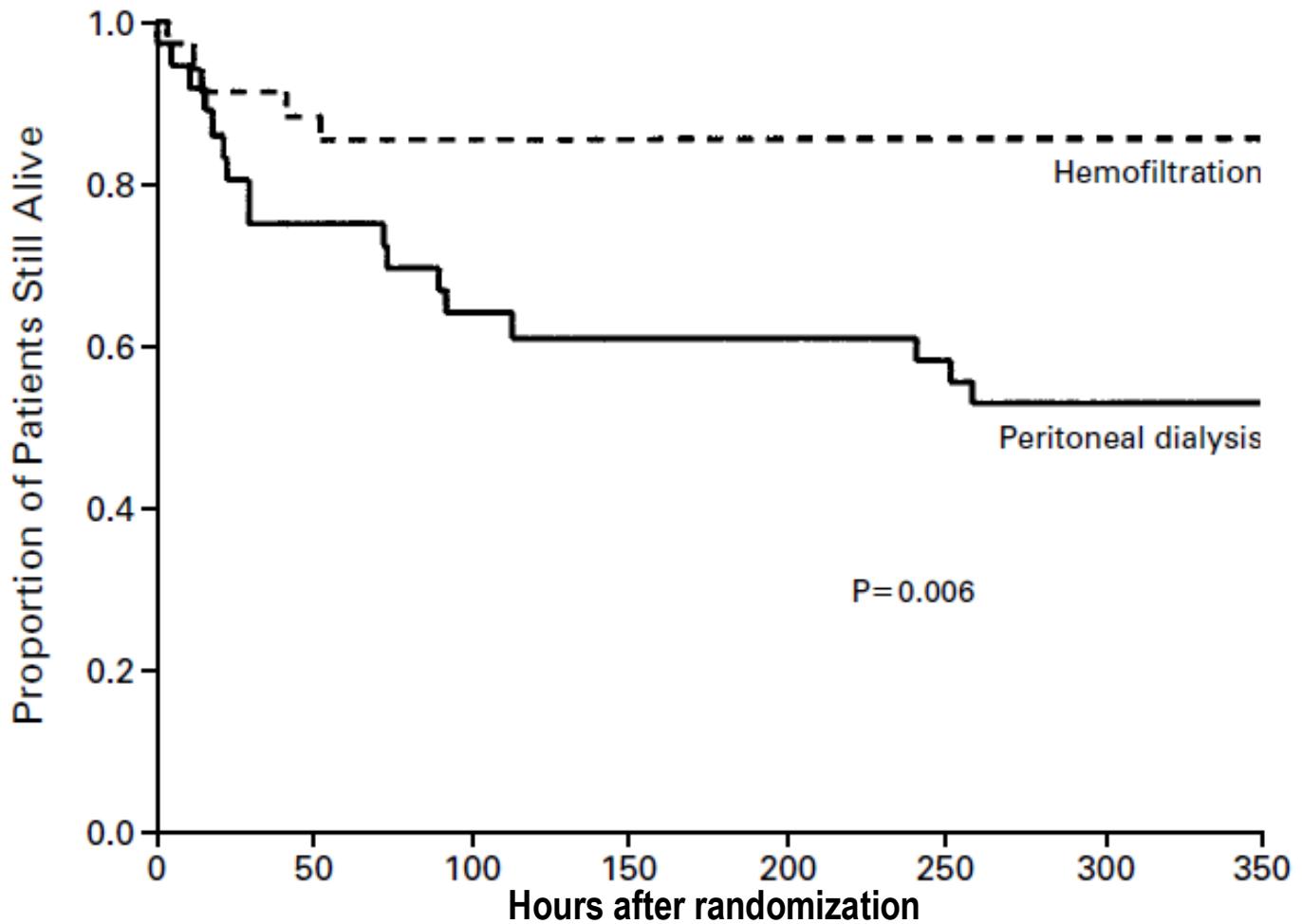
ISPD GUIDELINES/RECOMMENDATIONS

CONSENSUS GUIDELINES FOR THE PREVENTION AND TREATMENT OF CATHETER-RELATED INFECTIONS AND PERITONITIS IN PEDIATRIC PATIENTS RECEIVING PERITONEAL DIALYSIS: 2012 UPDATE

Bradley A. Warady,¹ Sevcan Bakkaloglu,² Jason Newland,¹ Michelle Cantwell,³ Enrico Verrina,⁴ Alicia Neu,⁵ Vimal Chadha,¹ Hui-Kim Yap,⁶ and Franz Schaefer⁷

*Division of Pediatric Nephrology,¹ Children's Mercy Hospitals and Clinics, Kansas City, Missouri, USA;
Gazi University,² Ankara, Turkey; Great Ormond Street Hospital,³ London, England; G. Gaslini
Children's Hospital,⁴ Genoa, Italy; Johns Hopkins University School of Medicine,⁵
Baltimore, Maryland, USA; National University of Singapore,⁶ Singapore;
and University Children's Hospital,⁷ Heidelberg, Germany*

HEMOFILTRATION AND PERITONEAL DIALYSIS IN INFECTION-ASSOCIATED ACUTE RENAL FAILURE IN VIETNAM



Phu et al. New Eng J med 2002

Is peritoneal dialysis adequate for hypercatabolic acute renal failure in developing countries?

**VIPUL CHIMANLAL CHITALIA, ALAN FERNANDES ALMEIDA, HARINAKSHI RAI, MANSI BAPAT,
KINNARI VIPUL CHITALIA, VIDYA N. ACHARYA, and RAMESH KHANNA**

Division of Nephrology, Department of Medicine, Renal Laboratory, and Department of Dietetics, Seth G.S. Medical College & King Edward Memorial Hospital, University of Bombay, Mumbai, India; Department of Dietetics, University of New Haven, Yale School of Medicine, New Haven, Connecticut, and Division of Nephrology, Department of Medicine, University of Missouri Health Science Center, Missouri, St. Louis, USA

Chitalia VC et al. Kidney Int 2002

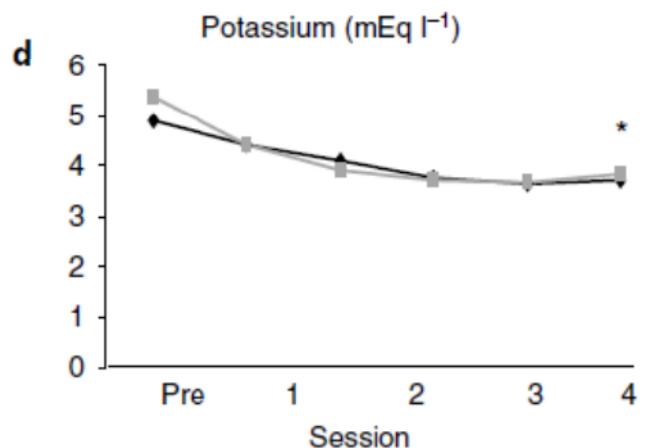
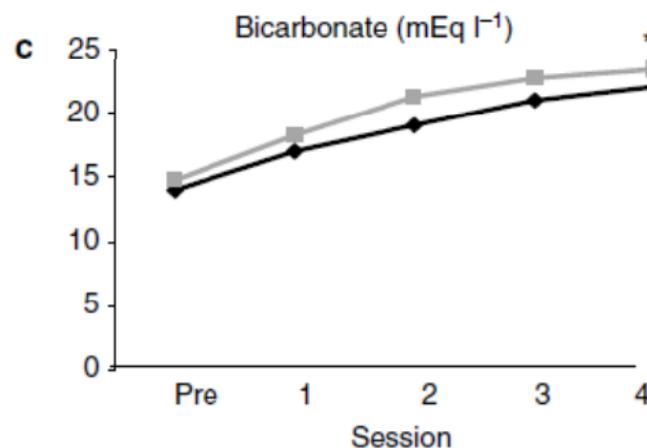
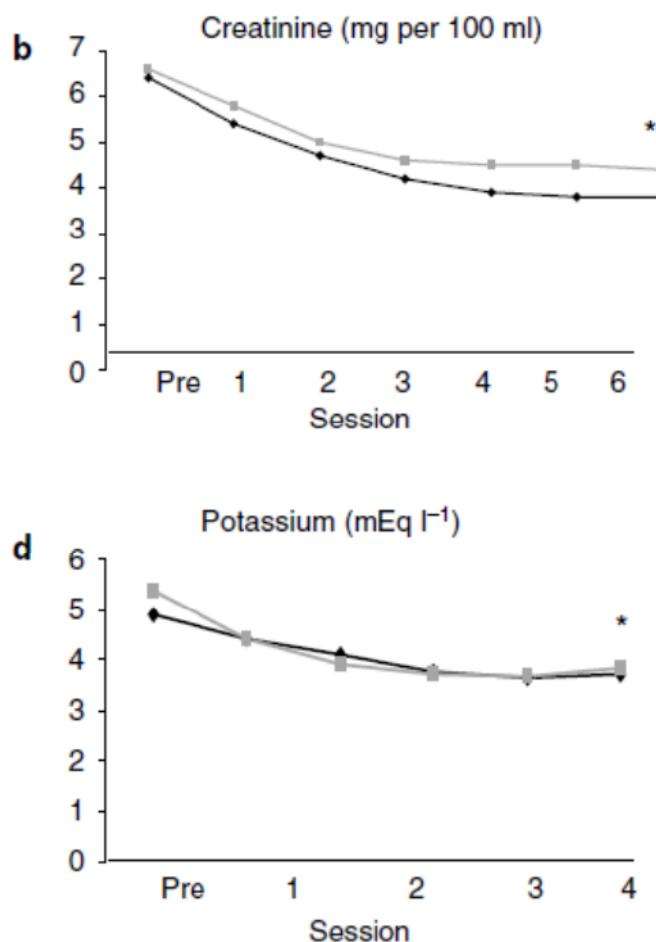
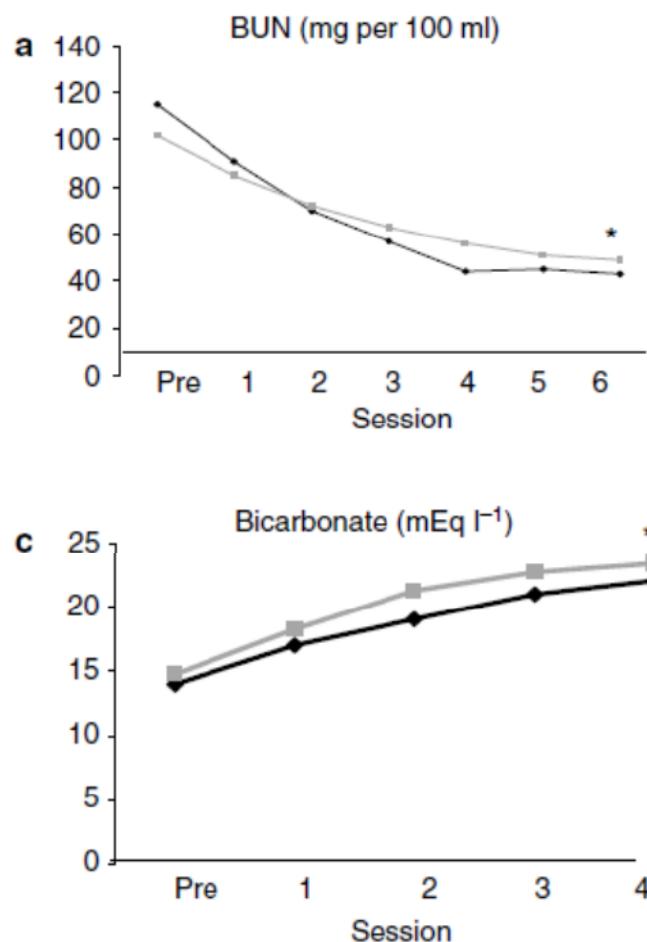
High volume peritoneal dialysis vs daily hemodialysis: A randomized, controlled trial in patients with acute kidney injury

DP Gabriel¹, JT Caramori¹, LC Martim¹, P Barretti¹ and AL Balbi¹

¹*Department of Internal Medicine, University Hospital, Botucatu School of Medicine, São Paulo State University (UNESP), Botucatu, SP, Brazil*

Gabriel DP et al. Kidney Int 2008

COMPARISON OF METABOLIC CONTROL IN HVPD & DHD



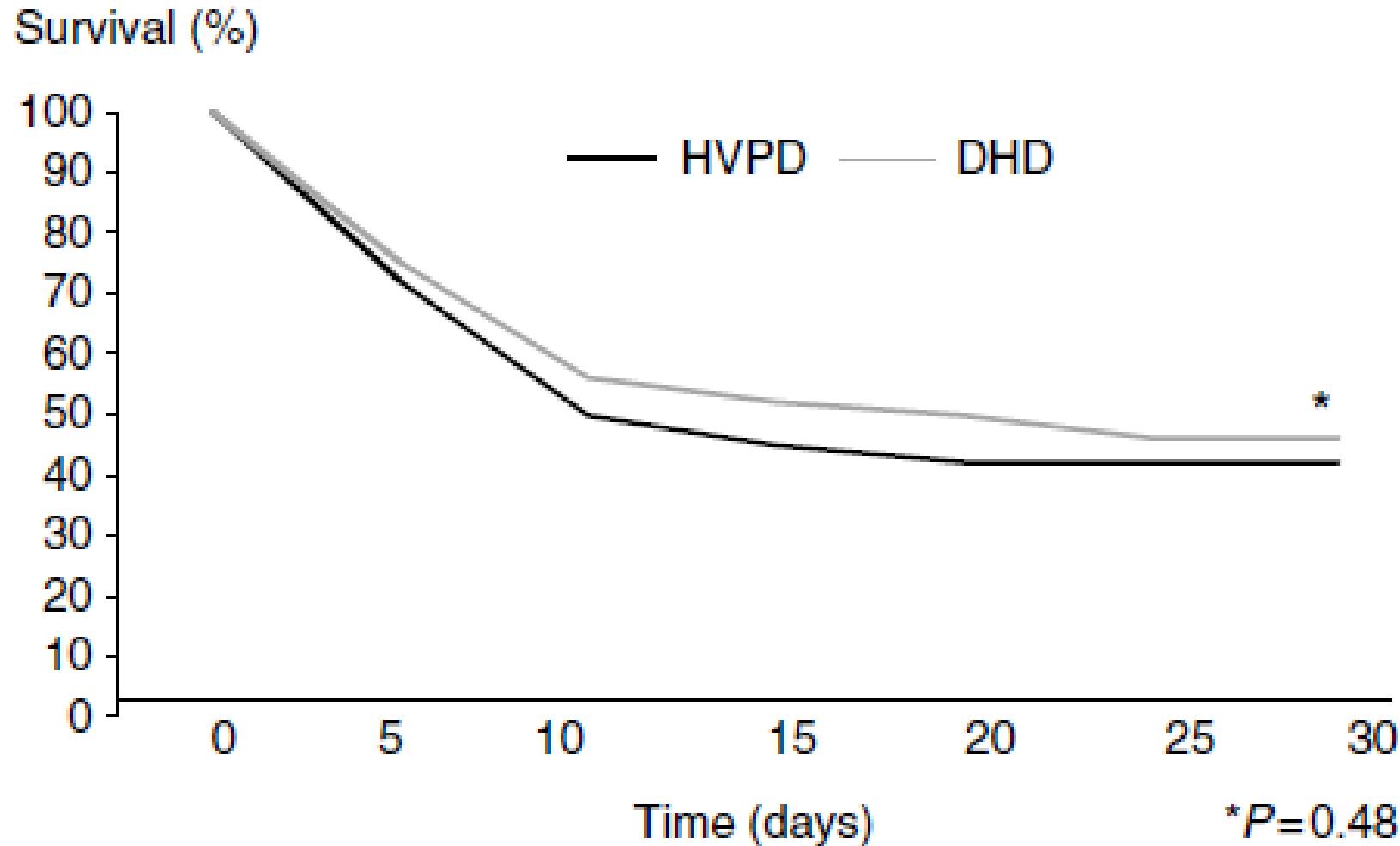
Session

0 Pre 1 2 3 4

Session

0 Pre 1 2 3 4

COMPARISON PATIENTS SURVIVAL BETWEEN HVPD & DHD AFTER 30 DAYS TREATMENT



Gabriel DP et al. Kidney Int 2008

SUMMARY

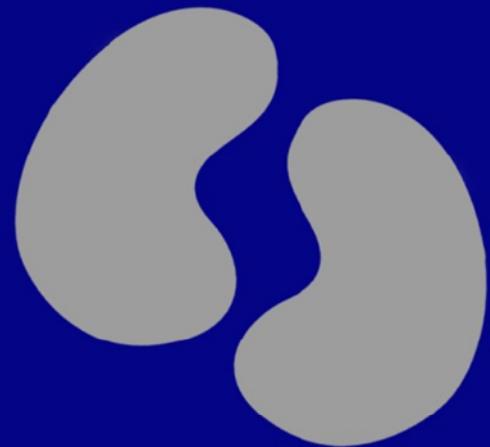
- The use of PD is critical in the treatment of AKI in facilities and countries where pediatric HD and CRRT are not available
- Clinicians have a relatively greater comfort level with this therapy
- Sometime...simple is the best!!!

WE

BELIEVE

PMK KIDNEYKIDS CARE

ขอบคุณครับ



This document was created with Win2PDF available at <http://www.win2pdf.com>.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.
This page will not be added after purchasing Win2PDF.