ASN- Home Dialysis University
Virtual Session #6

Prescribing Peritoneal Dialysis

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Topics to Discuss

- Writing the initial PD prescription
- Making PD prescription adjustments for
  - Fluid overload
  - Insufficient solute clearance
- Incremental PD
- Urgent Start PD

Guidelines

PERITONEAL DIALYSIS INTERNATIONAL

Peritoneal Dialysis International
1–10

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journals.sagepub.com/home/ptd

SAGE

International Society for Peritoneal Dialysis practice recommendations: Prescribing high-quality goal-directed peritoneal dialysis

Edwina A Brown[1], Peter G Blake[2], Neil Boudville[3], Simon Davies[4,5], Javier de Arteaga[6], Jie Dong[7], Fred Finkelstein[8], Marjorie Foo[9], Helen Hurst[10], David W Johnson[11], Mark Johnson[12], Adrian Liew[13], Thyago Moraes[14], Jeff Perl[15], Rukshana Shroff[16], Isaac Teitelbaum[17], Angela Yee-Moon Wang[18] and Bradley Warady[19]

What are the Goals of the PD Prescription in the Context of Delivering High Quality PD Care?

To provide the best health outcomes possible for an individual on peritoneal dialysis to maintain their:

- Clinical well-being
- Quality of life
- Ability to meet life goals
- While minimizing treatment burden

Peritoneal Dialysis Prescription

Case 1

The Initial Prescription for the Patient with No Residual Kidney Function

Teitelbaum I. Clin J Am Soc Nephrol 13:483, 2018

Though I'm not enamored of Kt/V_{urea}, as a marker of dialysis "adequacy" it may be a useful tool for estimating an initial prescription.

If we target a weekly Kt/V_{urea} of 1.7 then, daily…

$$\frac{D_{urea}/P_{urea} \times DV}{TBW} = 0.25.$$

Assume, definitely incorrectly, that $D/P_{urea} = 1$. Then DV= 0.25 TBW

(By using 0.6 x weight for TBW we partially correct for the erroneous assumption, above).

If UF is assumed to be 1L then the prescribed instilled volume must be

0.25 x TBW – 1 L.

Case 1- Discussion

Our patient is an adult woman weighing 90 kg. TBW is 45-50 L; let's work with 48 L. Assume UF of 1L.

We estimate that an initial prescription of at least 11 L of dialysate is needed (48 x 0.25 - 1).

Possible regimens include:

CAPD: 3 x 2.5 L daytime + 3 L night (4 x 2.75 L ?)

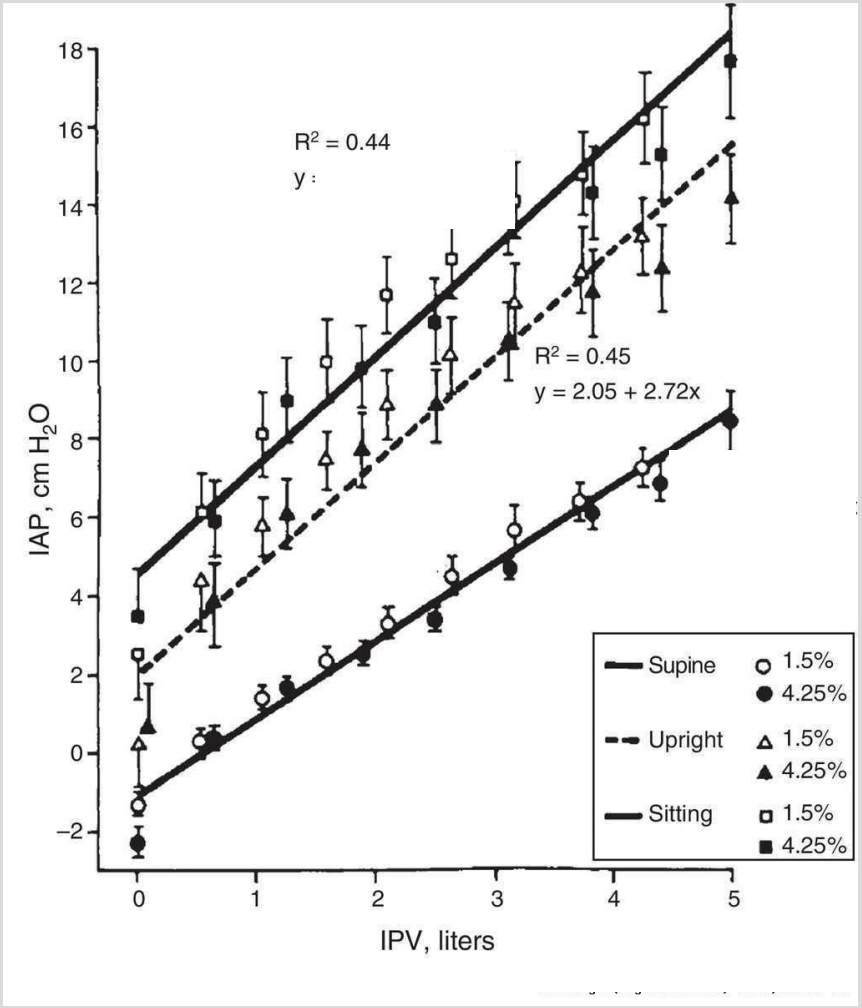
NIPD: 5 x 2.2 L with no LF.

CCPD: Fewer or smaller night exchanges with addition of LF.

Effect of Patient Position on IP Pressure

Perez- Diaz et al. Nefrologia 37:579, 2017
Twardowski et al. Kid Int 23:64, 1983

Patients are generally able to tolerate volumes of 1.25- 1.5L/ m^2 BSA



Seated

Upright

Supine

Case 2

Case 2- Discussion

Our patient is an adult man weighing 88 kg. TBW is again, around 48 L.

This gentleman was doing well prior to losing RKF, presumably as a result of his illness.

Two therapeutic goals:

- Address volume overload
- Increase solute clearance

Case 2- Discussion

- Strategies to address volume overload
  - Is he on diuretics? Initiate and/or increase dose.
  - Change from 1.5%: 2.5% mix to all 2.5%.
- Strategies to enhance solute clearance
  - How much more clearance does he need? I **ball-park** another 0.35 on Kt/V_{urea} (He's gone from 1.90 to 1.45; 0.35 more will get him to 1.80. I won't argue if you go with targeting the full 1.90).
  - At D/P_{cr} of 0.7 he is likely to have D/P_{urea} virtually 1.
  - So, he needs a daily increase in Kt/V_{urea} of 0.05.
  - t= 1 and V is 48 L. 48 x 0.05= 2.4. So, we need to increase saturated dialysate by 2.4L daily. Assuming UF remains constant, we could try:
    - 4 x 2.6L in 9 hours
    - 5 x 2.1 L in 10 hours (if he's willing; OK to try to keep at 9)
    - 4 x 2.1 L + 2L LF

Incremental Peritoneal Dialysis

The practice of using residual kidney function (RKF) to achieve the total desired solute (or volume) removal, and initially prescribing a more modest dose of PD. The PD prescription is then increased incrementally as RKF falls.

Potential Strategies for Incremental Peritoneal Dialysis

- Fewer exchanges
- Smaller volumes
- Fewer hours
- Reduced number of days/ week

Case 3

Case 3- Discussion

- At 80 kg, this patient has estimated TBW 48 L. With plasma urea of 50 mg/dl, and 1 L of urine daily with a urea concentration of 240 mg/dl, the daily residual urinary Kt/V_{urea} is 0.1 (240/50 x1/48).
- Subtracting this from 0.25 and then substituting 0.15 in place of 0.25 in the equation above yields an estimate of 7.2 L for the needed drain volume.
- Assuming 1 L of daily UF, one would need a dose of just 6.2 L of dialysate.

Case 3- Discussion

- Possible prescriptions include:
  - 3 x 2.1 L nightly
  - 4 x 2 L five nights weekly
  - Or would he prefer CAPD- unlikely, but for the sake of the exercise…

Case 4

Case 4- Discussion

- Amazingly, this patient too has TBW around 48 L…
- Assuming 1L daily UF and D/P urea of 1, his pKt/V is 77/48= 1.60. So rKt/V is 0.5 (2.1-1.6). We therefore should supply around 1.2, or 75% of the prior prescription. But, for just 10-14 days, he'll be OK with a little less.
- The important things are:
  - No day fill for now
  - Smaller volumes at night

Case 4- Discussion

- Might start with 6 x 1 L over 10-12 hours (the longer the better- he's probably not back at work just yet…).
- After 10-14 days could begin increasing the dwell volume while decreasing number of cycles and time.
- Should be able to resume prior prescription by 4 weeks postop.

Urgent Start PD

- PD in a newly diagnosed ESKD patient who does not have a plan for renal replacement therapy
- Time to initiation < 2 weeks (as little as 24 – 48 hours) after PD catheter insertion

Urgent-start PD is not acute PD for acute kidney injury

A Suggested Algorithm for Urgent Start PD

Ghaffari A et al. Perit Dial Int 33:611, 2013

BSA (m^2)	Initial Dwell Volume (mL)
< 1.65	750
1.66-1.80	1000
>1.80	1250

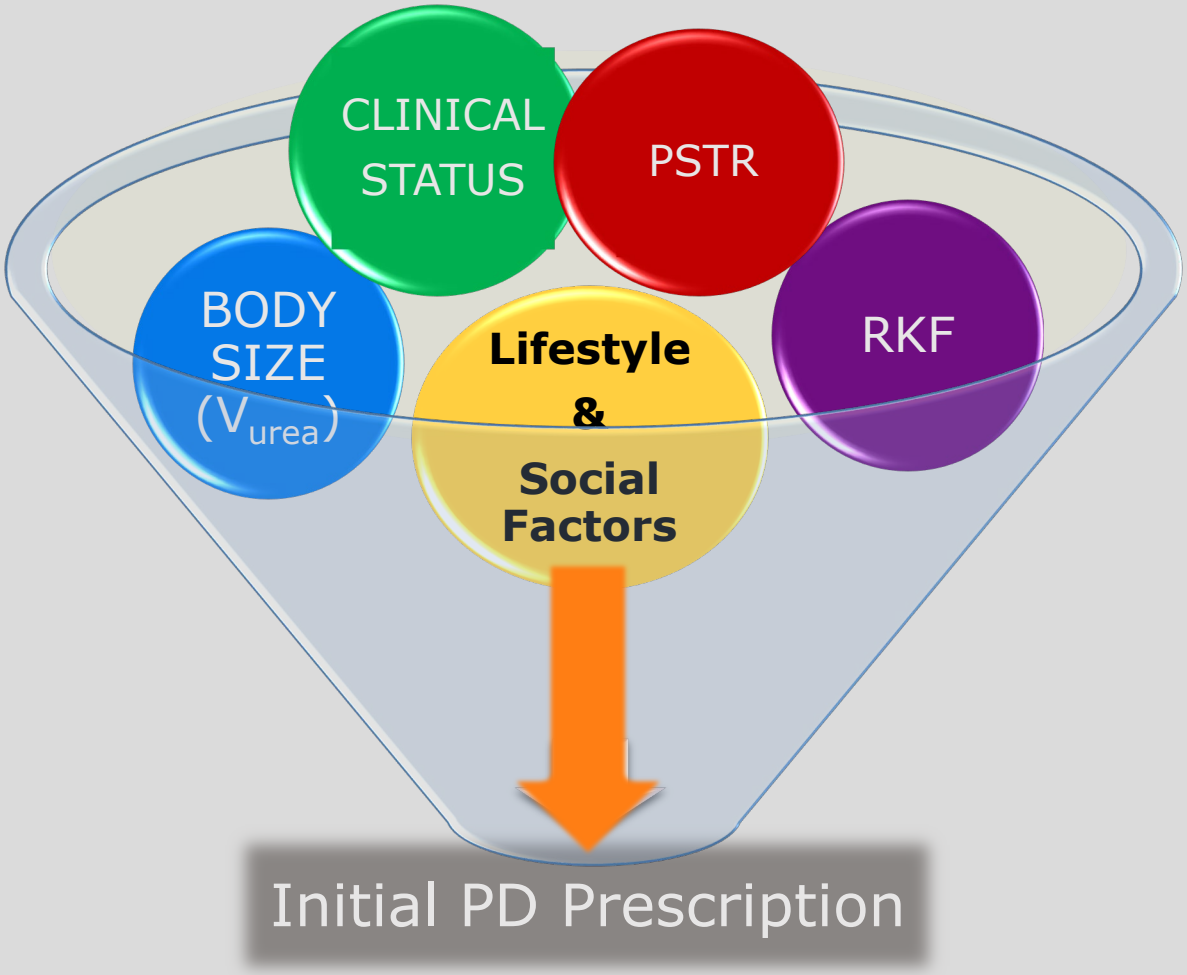
My Approach to the Initial Prescription

- I measure RKF and peritoneal Kt/V during training (usually only 2-3 exchanges per day over 5-6 hours).
- Then discuss with the patient what works best for him/her.
- Mutually agree on initial prescription.
- I emphasize that this is likely to change over time as RKF declines.

Activities Impacted by the Presence of Peritoneal Fluid

- Ballroom Dancing
- Biking
- Golf
- Sex
- Skiing
- Weightlifting

Considerations in Designing the PD Prescription



Courtesy of Dr. Anjali Saxena

Patients should do dialysis to live!
They should not live to do dialysis.

THANK YOU

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