

URGENT START PERITONEAL DIALYSIS CASE # 7

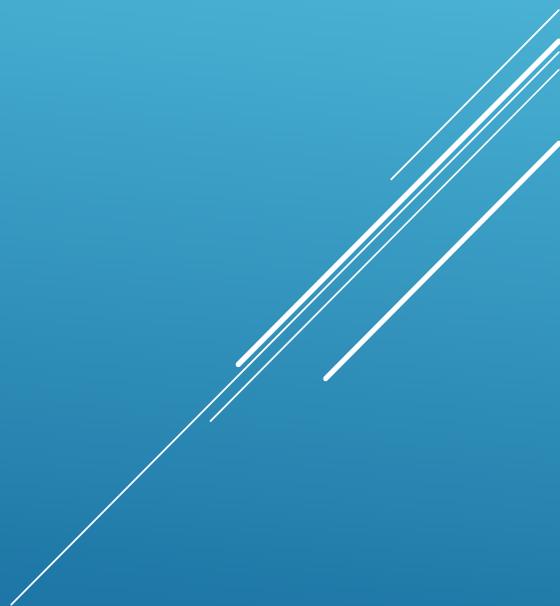
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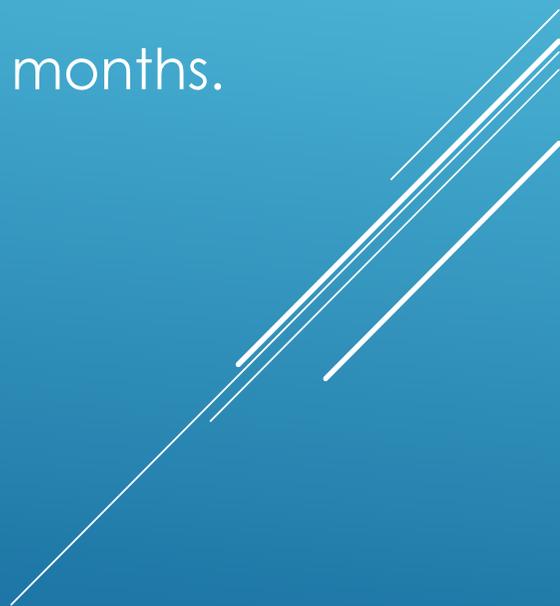
CASE PRESENTATION

- ▶ 55 y/o male with long-standing DM, HTN, CKD 4/5, lost to nephrology f/u for a year- moved from out of town to San Antonio but failed to establish nephrology care after moving as he lost insurance. He is admitted with worsening renal function, BUN 100 Creatinine 10, Bicarbonate 14, Serum potassium of 6.5, volume overload, with 3+ pedal edema and mild pulmonary edema on chest radiograph. Prior cholecystectomy. BMI is 40.
- ▶ No permanent vascular access
- ▶ h/o Prior cellulitis of the left leg 4 months ago.
- ▶ B/P 197/86 P 102 Afebrile, Pulse OX 89% on room air

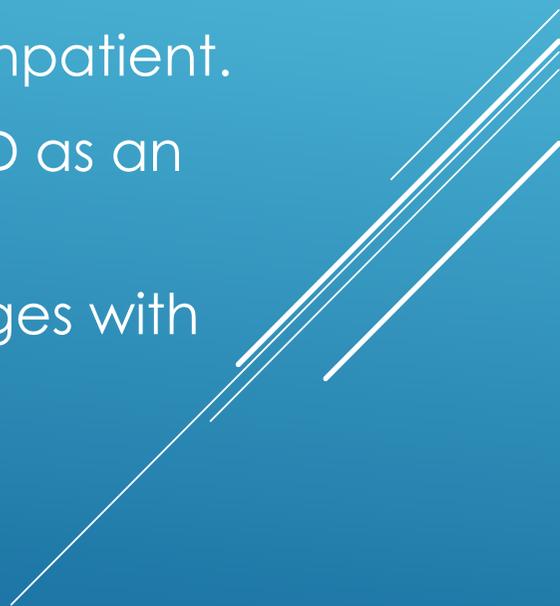
CASE PRESENTATION

- ▶ Standard medical therapy is given for hyperkalemia.
 - ▶ A right IJ temporary HD catheter is placed in the ER and the patient is emergently dialyzed.
 - ▶ Once stable Patient is felt to be at ESRD and require maintenance renal replacement therapy.
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WHAT USUALLY HAPPENS

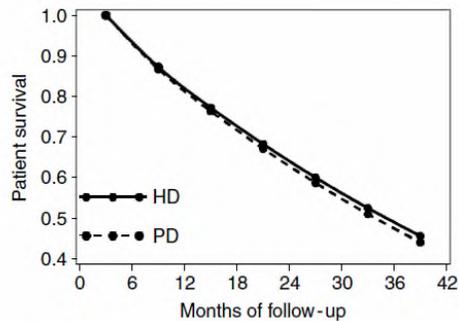
- ▶ A tunneled HD catheter is usually placed and the patient is put in an outpatient HD unit.
 - ▶ Once patient is funded (3 months later) the patient is setup for vein mapping and more permanent AV access.
 - ▶ The tunneled dialysis catheter may be in place for 3- 6 months.
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WHAT WE DID

- ▶ While the patient was undergoing daily hemodialysis, the PD nurse met with the patient and family. Compliance with therapy was stressed.
 - ▶ Home visit done while patient was still in the hospital
 - ▶ Percutaneous fluoroscopic PD catheter placed as an inpatient.
 - ▶ Patient was admitted to the PD unit after aggressive HD as an inpatient. (temp HD catheter removed on discharge)
 - ▶ “Urgent start” PD with low volume semi-supine exchanges with low volumes (< 1L) done thrice weekly.
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RATIONAL FOR URGENT START PERITONEAL DIALYSIS

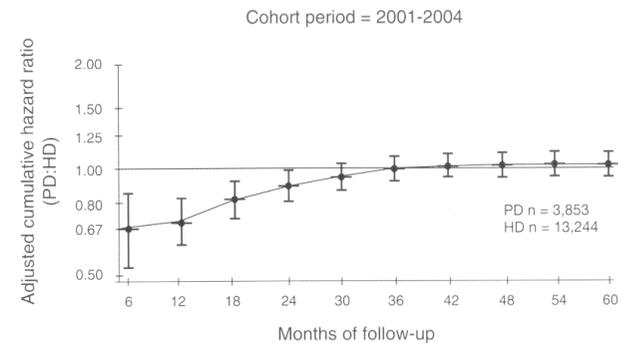
- ▶ Although long-term outcomes between ESRD patients treated with PD vs. HD are similar
- ▶ PD has been shown to have a short term survival over HD in the 1st 1-2 years. Analysis of this data has shown that this survival advantage can be explained by the use of CVCs in incident HD patients
- ▶ **In fact patients started on HD via CVC have an 80% higher mortality than those started on PD or HD with AVF/AVG in the 1st year. –Perl *et al.* JASN 2011**



Adjusted median life expectancy:
 HD: 35.1 months
 PD: 33.8 months

Figure 1 | Population-averaged survival curves comparing adjusted PD and HD survival based on an overall proportional hazards regression model for US Medicare patients (1995-2000). Adjusted median life expectancy: HD: 35.1 months; PD: 33.8 months.

Patients treated with PD have shown improved early survival (within the first 2 years) compared to those treated with ICHD¹⁻⁴



Adapted from Yeates K *et al.*¹

Analysis of data from the Canadian Organ Replacement Register (n=46,839) of survival outcomes for patients initiating PD or HD in Canada from 1991-2004 with follow up to December 31, 2007. Cumulative hazard ratios (PD:HD) were estimated by an intention-to-treat analysis using a nonproportional hazards model, with adjustment for case-mix differences, region, age, gender, race, cause of primary renal disease, diabetes, and comorbidity.

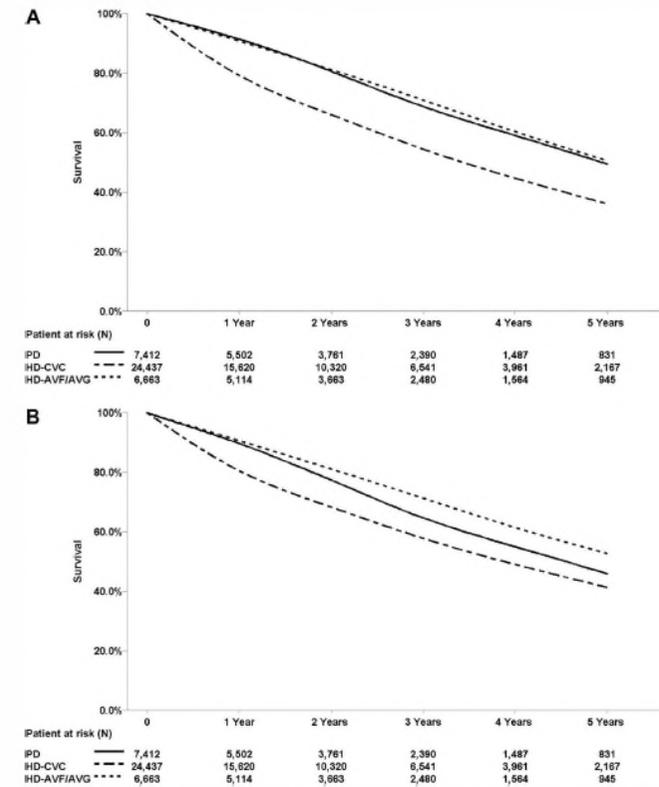


Figure 1. Survival curves for HD-CVC (short-dashed line), HD-AVF/AVG (long-dashed line), and PD (solid line) demonstrate higher 1-year mortality in HD-CVC patients. (A) Unadjusted. (B) Adjusted on the basis of a stratified Cox proportional Hazards model stratified by HD-CVC, PD, and HD-AVF/AVG and adjusted for age, race, gender, era of dialysis initiation, end-stage renal disease comorbidity index, primary renal diagnosis, serum albumin, eGFR, province of treatment, and late referral.

BARRIERS TO URGENT START PERITONEAL DIALYSIS

- ▶ Obtaining PD catheters quickly often a barrier as they are usually placed laparoscopically and require OR time, general anesthesia. And difficult to get placed in the unfunded patient.
 - ▶ HD catheters are quicker, cheaper
 - ▶ Hemodialysis in an acutely uremic patient is far more efficient at correcting metabolic derangements than PD
 - ▶ Familiarity with low volume supine peritoneal dialysis that was once ubiquitous is now not as much.
 - ▶ In Center PD is not always readily available- requires different staffing models and subject to various regulatory conditions.
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PERCUTANEOUS PD CATHETER PLACEMENT

- ▶ Can be done safely with good long-term patency either by peritoneoscopic or fluoroscopic methods.
- ▶ Success rates comparable to (standard) laparoscopic placement in most patients with uncomplicated abdomen
- ▶ Allows the PD catheter to be placed as an outpatient and in many cases can avoid having the patient admitted at all
- ▶ Incidence of peri-catheter leak is low, especially if the deep cuff is sutured at time of insertion.
- ▶ Unless you have an extremely willing and altruistic surgeon to help you out, many of us will need to either be able to place a PD catheter fluoroscopically or peritoneoscopically, or find someone (IR/IN) who can do it for them in an expedient manner- at least the outpatient setting.



SOME PRACTICAL SUGGESTIONS FOR INPATIENTS

- ▶ Consider Hemodialysis with temporary catheter in inpatients to “clean up” patients quickly over a few and place the PDC as an inpatient at the same time or shortly after temp cath:
 - ▶ Quicker control of metabolic parameters and volume status- gets them out of the hospital faster.
 - ▶ Allows PDC to rest for a few days- minimizing leak, and peritonitis
 - ▶ inpatients almost never follow instructions to be “supine” for very long.
- ▶ Really good dialysis as an inpatient means less work for your outpatient PD unit nurses:
 - ▶ They are able to train better once they are sent to the PD unit
 - ▶ PD unit may be able to just do 3 x a week low volume supine exchanges instead of daily (allows them to handle the Urgent start patient and existing workload better, or even a second urgent start
- ▶ Consider training the urgent start patient on Cycler 1st, THEN later CAPD
 - ▶ This gets the patient at home on dialysis quicker and makes the PD nurse workload more manageable.
 - ▶ More of the exchanges with this fresh catheter (< 2 weeks old) will be supine/semi-supine (less leak) also only 2 manipulations of PD catheter as opposed to multiple with CAPD.
 - ▶ Have PD nurses bring the patient in later when their schedule permits to do the CAPD training
- ▶ Be careful using 2L exchange and a 4.25% dextrose solution (red-bag) as net drain volume can be considerably higher than 2L and patient could have pericatheter leak.

ACUTE PD PRESCRIPTION (A LOT OF WORK FOR VERY LOW CLEARANCE)

- ▶ 1-1.5 sometimes 2L of dialysate can be instilled, supine exchanges, using a cycler
- ▶ Exchange time (dwell time plus inflow plus drain time) 1-2 hours
- ▶ In severely ill patients with average peritoneal transport characteristics, a 2L exchange and 1 hour exchange times (30min dwell, 30min for fill/drain) with a cycler x 24 hours- 48L exchanged and typically dialysate Urea concentration will be about 50% that of plasma- giving you a Urea clearance of about 10 ml/min (Lower end of typical CRRT clearances)
- ▶ For more stable patients use 1-1.5 sometimes 2L dialysate, 1.5-4 hour exchange times x 24 hours with cycler
- ▶ Multiple protocols exist to assist in planning PD prescription in acute setting. Vary dextrose concentration for fluid removal.
- ▶ Be careful using 2L exchange and a 4.25% dextrose solution (red-bag) as net drain volume can be considerably higher than 2L and patient could have pericatheter leak.

REF: Handbook of Dialysis, Third Edition. Daugirdas MD et. Al.

IN CENTER PD SAMPLE ORDERS FROM DAVITA

INITIAL PRESCRIPTION: URGENT START PERITONEAL DIALYSIS

IPD will be used for treatment with patient in the supine position

- Solution:** 1.5% dextrose if no peripheral edema or shortness of breath
2.5% dextrose if edema or shortness of breath
4.25% if prescribed by treating MD

- Initial Rx:** CrCl > 5 ml/min or > 500 ml urine / 24 hours

BSA <1.7m ²	BSA >1.7m ²
750 ml	1000 ml
4 cycles	5 cycles

Cycler Time

4 cycles – minimum of 5:00 hours

5 cycles – minimum of 6:40 hours

6 cycles – minimum of 8 hours (staffing and time permitting)

After 3 treatment days without a leak or complication, may double the volume or increase frequency of treatment per physician order.
After 2 weeks without a leak or complication, increase to full volume per physician order.

All exchanges are to be performed with the use of a cycler in supine position
Have patient use bathroom before being connected to cycler
The patient should remain supine while dwelling any fluid
If the patient needs to sit up or stand, he/she will have to be fully drained
If patient has a cough, call physician for a cough suppressant
Tell patients to avoid straining; if constipated, call physician for laxative
Instruct patient to wear loose clothing
If patient eats during dialysis, it should be limited to the drain phase of exchange
If patient has severe volume overload, call MD for high dose oral diuretic and 4.25% dialysate

