

Washington University in St. Louis, Nephrology Home Dialysis Curriculum 2019-2020

Staff

- Dr. Daniel Coyne
- Dr. George Jarad
- Dr. Charbel Khoury
- Dr. Tinting Li
- Dr. Anubha Mutneja
- Dr. Frank O'Brien
- Dr. Marcos Rothstein
- Cheryl Cress RN, home modalities nurse coordinator
- Andrea DeMoulin, home modalities nurse coordinator
- Kathy Ehrhard RN, home modalities nurse coordinator
- Katie Keene RN, home modalities nurse coordinator
- Shawna McMichael RN, home modalities nurse coordinator
- Christie Smith, home modalities nurse coordinator
- Andrew Wasson, home modalities nurse coordinator
- Natalie Moretz RD, dietitian
- Samantha Najduch, clinical social worker
- Lana Torry MA
- Tiffany Dulaney MA
- Patrick Hasamear, technical services manager

Locations

- Forest Park Kidney Center, 4205 Forest Park Avenue, St. Louis, MO
- Barnes Jewish West County Hospital, 12634 Olive Blvd, St. Louis, MO
- Barnes Jewish Center for Advanced Medicine- South County, 5201 MidAmerican Place, St Louis, MO

Current Clinic Schedules

Monday

- a.m. Rothstein, week 2 and 4
- p.m. O'Brien, week 3 and 4

Tuesday

- a.m. Coyne, week 3
- Khoury, week 4

Thursday

- a.m. Lj, week 2
- Mutneja, week 4
- p.m. Jarad, week 2
- Coyne (South County) week 3

Background

The main objective of this rotation is to increase exposure to patients on home dialysis - peritoneal and home hemodialysis. We expect that by the end of your two years of fellowship, you will be highly proficient in home modalities.

These patients are different from the usual ESRD patients that you see in the hospital. They are generally well, active, and are thriving in their communities. Home therapies patient account for almost 10% of all patients on dialysis in the United States, and WUSTL has approximately 120 patients on home dialysis. This makes it the one of the largest home modalities service in the country.

This clinic is also unique in that it champions inter-professional education and collaborative practice. At each clinic visit, the patient is seen by an MD, a specialist RN, dietician and social worker. To allow this to occur smoothly, each clinic is capped at 12 patients allowing ample time for the patient to be seen by each specialist. This also allows sufficient time for teaching and training.

Learning Objectives

Over the course of your two years, we encourage you to take advantage of this learning environment and try to attend as many of the non-clinic teaching sessions as possible.

- PD catheter examination and care techniques
 - Become familiar with catheter location
 - Learn to examine catheter for signs of infection
 - Learn what is involved in troubleshooting catheter malfunction

- When to alert kidney center of catheter concerns
- Attendance at home therapies clinic
 - See patients with designated teaching attending
 - Learn what each services each specialist provides to the patient during routine visit
 - Learn the clinical parameters that the MD checks during each visit
 - Learn about the different types of PD solutions, and why they are used
 - Learn about typical medications patients would be on o Experience the inter professional nature of the clinic
- Shadowing home therapies nurse coordinators for PD training
 - Attend PD training with patient and RN
 - Learn the steps that patients go through to get trained on PD
 - Learn what patients would be less suited for home dialysis
 - Learn the basics of the PD machine and how it works
 - Learn how patients are taught to troubleshoot
 - Observe a PET and interpret results
- Attending a home visit
 - Travel with the home therapies RN to patients house
 - Learn what the RN's assess when they do a home visit
 - Learn about the basic hygiene rules at home
 - Learn how to deal with special situations
 - Infants
 - Pets
 - Insects
 - Electricity
 - Water
- Shadowing home therapies RN for home HD training
 - Attend home HD training with patient and RN o Learn the basics of the home HD machine
 - Learn how to use the machine just like the patients
 - Learn how patients troubleshoot problems

- Learn how to examine a AVF or AVG, and learn what patients are told about preventing complications
- Catheter placement
 - Observe PD catheter placement/reposition with VIR/surgery
- Lab review with dietician
 - Sit with dietician and learn how they assess patients diet, and medication compliance
 - Learn the basics of how to assess overall nutritional status
 - Dietary potassium management
 - Dietary calcium/phosphate management
 - Medical phosphate management (binders, vitamin D)
 - Binder taste test
- Social work review
 - Learn about Medicare/Medicaid eligibility
 - Social work provisions for home therapies patients
 - How to work while on dialysis
 - How to keep people working
 - If they can't work, how can we help them
 - Medication costs
- Water treatment
 - Tour of water treatment plant with chief technician
 - Learn about the process of "cleaning" city water so that is safe for use in hemodialysis o Learn the basics of each of the water purification methods
- Multi-disciplinary meeting attendance
 - Attend monthly multidisciplinary meeting where patients are discussed with MD, nurse, social

worker, dietician, patient care coordinator and fellows

- Discussion on recently admitted patients
- Discussion on the overall health of certain patients to get a more global view of they are doing

Learning Objectives Checklist

Over the course of your **two** years, please complete the following activities

| Activity | #1 | #2 | #3 | Signature | Signature |
|------------------------|----|----|----|-----------|-----------|
| PD training | | | | | |
| PD transfer set change | | | | | |
| PET and interpretation | | | | | |
| PD home visit | | | | | |
| Home HD training | | | | | |
| Home HD home visit | | | | | |
| Dietician Visit | | | | | |
| Social Work visit | | | | | |
| Water treatment tour | | | | | |
| QI Meeting | | | | | |

Some of these activities will be done during your off service time, others can be scheduled around your clinic or when on less busy rotations. Please sign off on each activity with one of the home therapies staff.

Written Curriculum - Self Study

Teaching MD will provide information on how to access this website. These lectures are for self-study. <https://ispd.org/NAC/education/pd-curriculum/>

| # | Lecture Title | Mandatory | Date completed |
|----|--|-----------|----------------|
| 1 | Anatomy and Physiology of Peritoneal Dialysis | * | |
| 2 | Peritoneal Dialysis Prescription and Modalities | * | |
| 3 | Peritoneal Dialysis Adequacy | * | |
| 4 | Ultrafiltration in PD: Physiologic Principles | * | |
| 5 | Importance of UF and Clinical Management in PD | * | |
| 6 | Peritoneal Dialysis Catheter Placement and Management | * | |
| 7 | PD Related Infections | * | |
| 8 | Decreasing the Incidence of Peritonitis | * | |
| 9 | Non infectious complications of peritoneal dialysis | * | |
| 10 | Nutritional Requirements of Peritoneal Dialysis | | |
| 11 | Bone and Mineral Metabolism in PD patients | | |
| 12 | Encapsulating Peritoneal Sclerosis | * | |
| 13 | Chronic kidney disease education | | |
| 14 | Options for renal replacement therapy: Comparison of modalities | * | |
| 15 | Patient training and staff education | | |
| 16 | Transitioning from CKD to RRT: A guide for CKD educators and CKD patients | | |
| 17 | Organization and structure of a Peritoneal Dialysis program: An important ingredient for success | | |
| 18 | Finances of Home Dialysis: Facility and Physician Payments | | |
| 19 | Medical Directorship of a Home Dialysis Unit | | |
| 20 | Peritoneal Dialysis in Special populations | * | |
| 21 | Home HD ASN curriculum | * | |

You should plan on discussing one of these lecture with your attending at each monthly clinic starting August of year 1. You should aim to have 11 lectures done by end of year one.

PD Quiz

It is best to take this quiz at the following times:

August year 1

July year 2

April year 2

Each quiz should be done with your clinic attending.

1. 45-year-old patient on CCPD for past 3 years. The PD RN alerts you that there is some erythema at the exit site. Patient feels well and is afebrile. On exam, abdomen is soft. Exit site erythema is noted. Minimal purulence seen. Catheter is not tender to manipulation. PD fluid is clear, subsequent cell count is negative. You send exit swab. What is your next plan?
 - a. Nothing, await C&S
 - b. IP cefazolin
 - c. Oral cephalexin
 - d. Topical gentamicin
2. 60-year-old woman on CAPD for past 4 years has been admitted to BJH with chest pain, will be kept by medical team for ~48 hours to rule out NSTEMI. Her home regimen is 4 x 2.7L exchanges, 2.5% glucose per day. She reports that her outside nephrologist is "happy with her treatment". She has a BP of 110/60. She is 70 kg. The dialysis RN reminds you that we can only do CCPD.

Please write the prescription that will provide a weekly Kt/V of 1.8. (This question is basically "how to prescribe CCPD" for this patient)
3. 56-year-old man on PD for past 1 year. Has had rough initial start due to poor compliance with bowel regimen. In past 3 months things have been going much better. He calls the on call nephrology fellow in panic. "Dr. there is blood in my PD fluid". List some differential diagnoses.
 - a. Colorectal CA
 - b. Diverticulitis
 - c. Pancreatitis
 - d. Trauma
 - e. On anticoagulation
 - f. Renal cell carcinoma
4. 30-year-old woman on CAPD has been admitted to an outside hospital with pneumonia. She is a Forest Park patient and instructs the RN at this hospital to call the WUSTL nephrology fellow with any problems. At 20:00 the floor RN calls you (for 5th time) that the PD fluid is not draining. She reports there is no pain, but cannot be any more specific. You got sign out earlier that day

about this patient, specifically it was reported that her PD was going really well in the community. Please list your differential diagnoses.

- a. Constipation
 - b. Catheter malposition
 - c. Fibrin
 - d. Staff unfamiliarity with PD
5. You have now established that there is a fibrin clot in the catheter. You advise the RN to hold PD for now and you will manage the problem. How? List all that are correct.
- a. High volume saline flush
 - b. Alteplase instillation for one hour
 - c. New catheter
 - d. Add heparin to PD fluid
6. 84-year-old woman attends the ED with chest pain. She is a Forest Park patient and tells you that she does CCPD but cannot remember her prescription. She is 80kg. Can you create an adequate CAPD prescription for her? Please write the prescription that will provide a Kt/V of 1.8
7. 55-year-old woman on PD peritoneal dialysis for the last 3 years. Over the last 12 months, her urine volume has gradually diminished, and by the time of her last assessment of dialysis adequacy, she had become anuric with a weekly Kt/V of 1.5. She has been doing CCPD as follows: 2.5 L x 4 exchanges overnight with 2.5 L last bag fill with dextrose-based solution. Which of the following is the MOST effective initial approach to improve adequacy
- a. Transfer to hemodialysis
 - b. Add a 2.5-L day-exchange following the last bag fill
 - c. Change the last bag fill from dextrose-based solution to icodextrin
 - d. Increase the number of night-time exchanges to seven
8. A 63-year-old man has been undergoing CAPD for the past 4 years and attends for his monthly visit. His peritoneal dialysis prescription consists of four exchanges of 2.5 L, 2.5% dextrose. He is anuric. At the time of his most recent assessment of peritoneal dialysis adequacy, the following parameters were obtained:
- Serum urea nitrogen: 77 mg/dl
 - Dialysate urea nitrogen: 72 mg/dl
 - Total ultrafiltration volume: 1000 ml
 - Volume of distribution of urea: 40 L

Which of the following represents the CLOSEST approximation of the weekly Kt/V_{urea}?

- a. 1.4
 - b. 1.6
 - c. 1.8
 - d. 2.0
 - e. 2.2
9. 63-year-old male has been undergoing CAPD for the past 4 years and attends his monthly visit. His peritoneal dialysis prescription consists of four exchanges of 2.5 L, 2.5% dextrose. He is anuric. You are going to assess his adequacy, what do you need to know?
- Serum urea nitrogen: 77 mg/dl
 Dialysate urea nitrogen: 72 mg/dl Total
 Ultrafiltration volume: 1000 ml
 Volume 40L

Now calculate Kt/V

Home Hemodialysis

- How to calculate the prescription
 - Visit www.ureaкинetics.org
 - Enter the solute solver calculator
 - See attached AJKD paper on how to enter variables
 - Please do this with one of the home HD nurses
- What is flow fraction
- How does this help reduce dialysate use in home HD

Prescription Examples

| Dialysate Volume | Qb (ml/min) | Qd(ml/min) | Qd/Qb | | Time | Urea Removal | PO4 removal | Large Solute Removal |
|------------------|-------------|------------|-------|--|---------|--------------|-------------|----------------------|
| 20L | 450 | 150 | 0.33 | | 2h23m | | | |
| 20L | 450 | 135 | 0.3 | | 2h39min | ↑ | ↑↑ | ↑↑ |
| 25L | 450 | 185 | 0.41 | | 2h23min | ↑↑ | ↑ | ≡ |
| 25L | 450 | 150 | 0.33 | | 2h54min | ↑↑↑ | ↑↑↑ | ↑↑↑ |

Can you explain the rationale behind the above?

Please see the attached documents on how to prescribe home HD;

- Solute solver-How to guide for calculating HHD adequacy

 - See also: urea-kinetics.org solute solver 2.1 urea

 - Username: solute Password: Solver

 - This is complex, so try to do this while in clinic and troubleshoot with nurses

- Solute solver AJKD article

- ASN home hemodialysis curriculum