PERITONEAL DIALYSIS (PD) – DIALYSIS ADEQUACY TESTS (CREATININE CLEARANCE AND Kt/V)

Cross references	NSW Health PD2007_036 - *Infection Control Policy* SGH-TSH CLIN027 - *Aseptic Technique - Competency and Education Requirements* SGH_WPI – *Continuous Ambulatory Peritoneal Dialysis (CAPD) Freeline Solo Exchange Procedure* SGH_WPI – *Automated Peritoneal Dialysis (APD) Set-up and Connection Procedure – HomeChoice Dialysis Machine* SGH_WPI – *Automated Peritoneal Dialysis (APD) End of Therapy and Disconnection Procedure – HomeChoice Dialysis Machine*
1. Purpose	To ensure the process of dialysis adequacy testing is performed correctly and according to best practice guidelines

2. Process

2.1 Devices

2.1.1 Equipment

- 24 hour urine bottle
- 24 hour collection of effluent
- PPE (gloves, gown and protective goggles)
- Alcohol Swabs
- Kt/V Form (see Appendix A)
- Kt/V Information Sheet (see Appendix B)
- Patient labels
- Pathology request forms

2.1.2 Key parts

- Drawing-up needle (18G)
- Specimen jar
- 20ml syringe

2.1.3 Key site

- Rubber bung on CAPD drain bag

2.2 Procedure

1. Educate the patient and/or carer on the importance of and preparation for dialysis adequacy testing by explaining and providing the following equipment:
    a. Kt/V information sheet (for APD [Appendix B] or CAPD [Appendix C] patients);
    b. 24 hour urine bottle;
    c. Specimen jar;

d. 20 ml syringe;
e. Patient labelled pathology request form for serum urea, creatinine, glucose and albumin tests;
f. Patient labelled pathology request form for 24-hour urine volume, urea and creatinine tests;
g. Patient labelled pathology form for PD effluent urea and creatinine tests.

2. The day before the dialysis adequacy test, the patient will:
   a. Collect PD effluent sample for 24 hours:
      i. APD patients to dialyse as per usual APD regimen. After dialysis is completed the next day, collect 20 mls of PD effluent from the drain bag/bucket using the syringe and specimen jar provided.
      ii. CAPD patients will collect all PD effluent from 2nd CAPD exchange up to 1st CAPD exchange the following day (approximately 4-5 drain bags).
   b. Collect urine for 24 hours by:
      i. Discarding the first sample of urine in the morning;
      ii. Collecting urine in the 24hr urine bottle from the second sample up to the first urine of the following morning.

      Note: If patient is anuric, collect effluent only
   c. Fast from midnight.
3. On the day of the dialysis adequacy test, the patient will:
   a. Record their weight;
   b. Record their Total UF (for APD patients only);
   c. Bring all the recorded information and deliver the collected 24 hour urine and PD effluent to the PD unit;
   d. Attend pathology for their fasting blood test with a patient labelled pathology request form for serum urea, creatinine, glucose and albumin tests.
4. On the day of the dialysis adequacy test, the nurse will:
   a. Measure patient's height and record on Kt/V form (Appendix A)
   b. Record patient's weight on Kt/V form
   c. Record total UF on Kt/V form (for APD patients only)

      Or

      Weigh all PD effluent drain bags, calculate UF and record on Kt/V form (for CAPD patients only)
   d. For APD patients, confirm with patient that the fluid inside the specimen jar is PD effluent

      Or

      For CAPD patients, obtain sample from each of the PD effluent drain bags ensuring all the key parts/sites are protected:
      i. Wear PPEs
      ii. Perform hand hygiene
      iii. Don gloves

iv. Alcohol swab the rubber bung on CAPD drain bags;
v. Attach the drawing up needle to 20 ml syringe;
vi. Push needle into the centre of the bung on a CAPD drain bag;
vii. Aspirate 5 mls of PD effluent from the CAPD drain bag;
viii. Repeat same procedure for the subsequent CAPD drain bags until PD effluent is collected from all the drain bags
ix. Mix and place collected PD effluent in a specimen jar;
x. Discard the remaining PD effluent
xi. Remove gloves and PPE
xii. Perform hand hygiene

e. Send the collected 24 hour urine to pathology with patient labelled pathology request form for 24-hour urine volume, urea and creatinine tests;
f. Send the collected 24 hour PD effluent to pathology with patient labelled pathology form for PD effluent urea and creatinine tests.

5. The day after the dialysis adequacy test, the nurse will:
   a. Record results on Kt/V data form;
   b. Enter results into the PD ADEQUEST program to calculate Kt/V and Creatinine Clearance;
   c. Document Kt/V and Creatinine Clearance results in RISC and patient notes
   d. Inform Nephrologist of results
   e. Educate and inform patient of Kt/V and Creatinine Clearance results and PD regimen recommendation or update

3. Network file	Renal, Peritoneal Dialysis
4. External references / further reading	Blake, P. G., Bargman, J. M., Brimble, K. S., Davison, S. N., Hirsch, D., McCormick, B. B., . . . Tonelli, M. (2011). Clinical Practice Guidelines and Recommendations on Peritoneal Dialysis Adequacy 2011. *Peritoneal Dialysis International, 31*(2), 218-239. doi: 10.3747/pdi.2011.00026 Goldberg, R., Yalavarthy, R., & Teitelbaum, I. (2009). Adequacy of peritoneal dialysis: beyond small solute clearance. *Contributions to Nephrology, 163*, 147-154. doi: 10.1159/000223793 Heimburger, O. (2009). How should we measure peritoneal dialysis adequacy in the clinic. *Contributions to Nephrology, 163*, 140-146. doi: 10.1159/000223792 Misra, M., & Nolph, K. D. (2000). Adequacy in dialysis: intermittent versus continuous therapies. *Nefrologia, 20 Suppl 3*, 25-32. Ponferrada, L. P., & Van Stone, J. C. (1995). Peritoneal dialysis kinetics. *Advances in Renal Replacement Therapy, 2*(4), 341-348. Tang, Y., Zhong, H., Diao, Y., Qin, M., & Zhou, X. (2014). Peritoneal transport rate, systemic inflammation, and residual renal function determine peritoneal protein clearance in continuous ambulatory peritoneal dialysis patients. *International Urology and*

	Nephrology. doi: 10.1007/s11255-014-0744-8 Vonesh, E. F., Story, K. O., & O'Neill, W. T. (1999). A multinational clinical validation study of PD ADEQUEST 2.0. PD ADEQUEST International Study Group. *Peritoneal Dialysis International, 19*(6), 556-571.
5. Specialty/department committee approval	Peritoneal Dialysis Committee , Dr Franziska Pettit, Staff Specialist Date: Feb 2017
6. Department head approval	Dr Mark Brown, Department Head Renal Services Date: Feb 2017
7. Executive sponsor approval – NCD or CGM	Christine Day, Nurse Manager Medicine Date: Feb 2017

Revision and Approval History

Date published	Revision number	Author (Position)	Date revision due
February 2017	0	Anna Claire Cuesta PD CNC	February 2020

Appendix A

Kt/V Form		**Date**		**CAPD Bags (Output)**	
				1	
Patient's Label				2	
				3	
				4	
				5	
Weight		**Height**		**COMPUTATION**	
SERUM CONCENTRATION				**CCL**	R
					D
Urea		**Glucose**		**Kt/v**	R
					D
Creatinine		**Albumin**		**nPCR**	
				PET Transport	
				D/P Creat at 4H	

	Urea	**Creatinine**	**Volume In**	**Volume Out**
24-hour Dialysate				
24-hour Urine				

Appendix B

PATIENT NAME_____

MRN_____

DATE_____

or affix Patient Identification Label here

PATIENT INFORMATION SHEET

DIALYSIS ADEQUACY TEST

(Kt/V and Creatinine Clearance)

for APD Patients

Urea (Kt/V) and Creatinine Clearance (CCl) tests is a combined annual test to check that you are dialysing adequately. Your dialysis regimen may change depending on the result of the test. The PD nurse will inform you if changes are to be made.

How to prepare for the test?

1. Equipment needed will be provided and explained to you by the PD nurse
2. 24 hour urine collection ☐

   The day before the test, discard your fist urine in the morning. Collect your urine for the rest of the day using the white bottle provided. Continue to collect your urine until your first urine the next day.
3. PD effluent sample ☐

   On the morning you finish collecting your urine, you must also collect some PD effluent from the drain bucket using the syringe provided. The collected PD effluent must be transferred to a yellow specimen jar labelled "PD fluid"
4. Record your Weight (_____ Kg) on the day of the test.
5. Record the Initial Drain and Total UF from your PD machine on the day of the test.

   ID: _____ml Total UF: _____ml
6. Bring all the recorded information, collected urine and PD fluid to the PD unit - 9 South St. Kogarah
7. Blood test ☐

   Present yourself to the St George Hospital SEALS pathology for a blood test with the labelled pathology request form provided to you by the PD nurse. You will be advised by the PD nurse if you need to fast for the blood test.

St George Hospital – Renal Care Centre Peritoneal Dialysis Unit – April 2015

Appendix C

PATIENT NAME_____

MRN_____

DATE_____

or affix Patient Identification Label here

PATIENT INFORMATION SHEET

DIALYSIS ADEQUACY TEST

(Kt/V and Creatinine Clearance)

for CAPD Patients

Urea (Kt/V) and Creatinine Clearance (CCl) tests is a combined annual test to check that you are dialysing adequately. Your dialysis regimen may change depending on the result of the test. The PD nurse will inform you if changes are to be made.

How to prepare for the test?

1. Equipment needed will be provided and explained to you by the PD nurse
2. 24 hour urine collection ☐

   The day before the test, discard your fist urine in the morning. Collect your urine for the rest of the day using the white bottle provided. Continue to collect your urine until your first urine the next day.
3. 24 hour PD effluent sample ☐

   The day before the test, discard the PD effluent/drain bag from your first CAPD exchange in the morning. Collect your PD effluent/drain bags from the second CAPD exchange and for the rest of the day. Continue to collect your PD effluent/drain bags until your first CAPD exchange on the next day. You would have collected a total of 4-5 PD effluent/drain bags.
4. Record your Weight (_____ Kg) on the day of the test.
5. Bring the recorded information, collected urine and PD effluent/drain bags to the PD unit - 9 South St. Kogarah.
6. Blood test ☐

   Present yourself to the St George Hospital SEALS pathology for a blood test with the labelled pathology request form provided to you by the PD nurse. You will be advised by the PD nurse if you need to fast for the blood test.

St George Hospital – Renal Care Centre Peritoneal Dialysis Unit – April 2015