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

Cross references	NSW Health PD2017_013 *Infection Prevention and Control Policy* NSW Health PD2017_026 *Clinical and Related Waste Management for Health Services* NHMRC *Australian Guidelines for the prevention and control of Infection in Healthcare* SGH-TSH CLIN027 *Aseptic Technique - Competency and Education Requirements* SGH PD WPI 217 *Continuous Ambulatory Peritoneal Dialysis (CAPD) Freeline Solo Exchange Procedure* SGH PD WPI 216 *Automated Peritoneal Dialysis (APD) Connection And Disconnection Procedure – Claria 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 & C)
- Patient labels
- Pathology request forms
- Opticap

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. 20mL syringe;
e. Opticaps for CAPD patients;
f. Patient labelled pathology request form for serum urea, creatinine, glucose and albumin tests;
g. Patient labelled pathology request form for 24-hour urine volume, urea and creatinine tests;
h. 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 20mL 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 (if needed for the blood tests).
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 blood test (±fasting) 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. Weigh patient and record on Kt/V form
   c. For APD patients – record total UF on Kt/V form

      Or

      For CAPD patients – weigh all PD effluent drain bags, calculate UF and record on Kt/V form
   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:
   e. Wear PPE as per NSW Health PD2017_013 *Infection Prevention and Control Policy* and NHMRC Australian Guidelines for the prevention and control of Infection in Healthcare

i. Perform hand hygiene
ii. Don gloves
iii. Alcohol swab the rubber bung on CAPD drain bags;
iv. Attach the drawing up needle to 20mL syringe;
v. Push needle into the centre of the bung on a CAPD drain bag;
vi. Aspirate 5mL of PD effluent from the CAPD drain bag;
vii. Repeat same procedure for the subsequent CAPD drain bags until PD effluent is collected from all the drain bags
viii. Mix and place collected PD effluent in a specimen jar;
ix. Discard the remaining PD effluent
x. Discard all used equipment as per NSW Health PD2017_026 Clinical and Related Waste Management for Health Services
xi. Remove gloves and PPE
xii. Perform hand hygiene

f. Send the collected 24 hour urine to pathology with patient labelled pathology request form for 24-hour urine volume, urea and creatinine tests;
g. 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 in Adequest (in Sharesource Remote Monitoring platform) to calculate Kt/V and Creatinine Clearance;
   c. Document Kt/V and Creatinine Clearance results in RISC, eMR and patient notes
   d. Inform Nephrologist of results
   e. Educate and inform patient of Kt/V and Creatinine Clearance results and of any recommendation for PD regimen change or update

3. Network file	Renal, Peritoneal Dialysis
4. External references / further reading	Bargman, J. M. (2016). We Use Kt/V Urea as a Measure of Adequacy of Peritoneal Dialysis. *Semin Dial, 29*(4), 258-259. doi:10.1111/sdi.12504 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 Brown, E. A., Blake, P. G., Boudville, N., Davies, S., de Arteaga, J., Dong, J., . . . Warady, B. (2020). International Society for Peritoneal Dialysis practice recommendations: Prescribing high-quality goal-directed peritoneal dialysis. *40*(3), 244-253. doi:10.1177/0896860819895364 Boudville, N., & de Moraes, T. P. (2020). 2005 Guidelines on targets for solute and fluid removal in adults being treated with chronic peritoneal dialysis: 2019 Update of the literature and revision of recommendations. *Perit Dial Int, 40*(3), 254-260. doi:10.1177/0896860819898307 Glavinovic, T., Hurst, H., Hutchison, A., Johansson, L., Ruddock, N., & Perl, J. (2020). Prescribing high-quality peritoneal dialysis: Moving beyond urea clearance. *Peritoneal Dialysis International, 40*(3), 293-301. doi:10.1177/0896860819893571

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5. Specialty/department committee approval	Peritoneal Dialysis Committee Dr Franziska Pettit, Staff Specialist Signature: 20.05.20
6. Department head approval	Dr George Mangos, Department Head Renal Services Signature: 20.05.20
7. Executive sponsor approval – Nurse Manager	Christine Day, Nurse Manager Medicine Signature: 28.05.20

Revision and Approval History

Date published	Revision number	Author (Position)	Date revision due
Feb 2017	1	Anna Claire Cuesta (PD CNC)	Feb 2020
May 2020	2	Anna Claire Cuesta (PD CNC)	May 2023

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) are combined tests completed every year to measure if you are dialysing adequately. Your nephrologist may request to repeat these tests within a year. Your dialysis regimen may change depending on the results of the tests. You will be informed of the results and it will be forwarded to your Nephrologist. You will also be informed if and when your PD regime must be changed to improve your dialysis adequacy.

How to prepare for the tests?

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. Weigh yourself and record your weight (_____ Kg) on the day of the tests.
5. Record the Initial Drain and Total UF from your PD machine on the day of the tests.

ID: _____ml Total UF: _____ml

6. Bring all the recorded information, collected urine and PD fluid to the PD unit – St George Hospital Renal Care Centre, 9 South St. Kogarah
7. Blood tests ☐

It is important to have your blood tests on the day of the dialysis adequacy test. After dropping off the specimen and information to the PD unit, present yourself to the St George Hospital SEALS pathology for blood collection 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 tests.

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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) are combined tests completed every year to measure if you are dialysing adequately. Your nephrologist may request to repeat these tests within a year. Your dialysis regimen may change depending on the results of the tests. You will be informed of the results and it will be forwarded to your Nephrologist. You will also be informed if and when your PD regime must be changed to improve your dialysis adequacy.

How to prepare for the tests?

1. Equipment needed (including Opticaps) 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. Start to collect your PD effluent/drain bags from the second CAPD exchange and for the rest of the day. Also collect your PD effluent/drain bags from your first CAPD exchange the following day. You would have collected a total of 4-5 PD effluent/drain bags. All these bags must be covered with Opticap to prevent leakage.

4. Weigh yourself and record your weight (_____ Kg) on the day of the tests.

5. Bring the recorded information, collected urine and PD effluent/drain bags to the PD unit – St George Hospital Renal Care Centre, 9 South St. Kogarah.

6. Blood test ☐

It is important to have your blood tests on the day of the dialysis adequacy test. After dropping off the specimen and information to the PD unit, present yourself to the St George Hospital SEALS pathology for blood collection 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 tests.

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