



Children's Health Ireland
at Crumlin

TITLE: Commencing Peritoneal Dialysis

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1.0 POLICY STATEMENT

The purpose of this document is to guide health care professionals to care for a child commencing peritoneal dialysis. It will provide staff members with the knowledge base required to care for patients commencing peritoneal dialysis and ensure the delivery of high quality safe practice to our patients.

2.0 SCOPE

This guideline will be used by St. Michael's C ward and in CHI@Crumlin staff who have undergone training and who are deemed competent in peritoneal dialysis.

3.0 GENERAL RESPONSIBILITIES

- All Staff: Adhere to all policies and procedures relevant to their area of work.
- Line Manager/Head of Department: to ensure their staff are aware of and compliant with all policies and procedures relevant to their area of work .
- Quality Department: Manage all completed policies and procedures via Q-Pulse or as local guidelines (CHI@Crumlin)

4.0 SPECIFIC RESPONSIBILITIES

It is the responsibility of the Renal Clinical Nurse Specialists and the Clinical Education Facilitators to implement guidelines into practice. Each staff member has a role to play in adhering to these guidelines when caring for a patient commencing peritoneal dialysis.

5.0 PROCEDURE

5.1 Introduction to Peritoneal Dialysis

Peritoneal dialysis is used to manage acute and chronic renal failure. The peritoneum is a membrane which lines the abdominal cavity. It has a rich blood supply making it an ideal area in which to carry out dialysis. Dialysis fluid is instilled into the peritoneal cavity through a Tenckhoff catheter. This fluid circulates through the abdomen in which toxins and solutes move across the membrane by diffusion and fluid removal occurs by osmosis. The fluid is then drained from the body after a prescribed period of time (ISPD 2012).

5.2 Clinical Indications for Peritoneal Dialysis

Acute Renal Failure

End stage renal Failure

5.3 Contraindications for Peritoneal Dialysis

A) Absolute contraindications

The only absolute contraindications for PD are those that affect the integrity of the abdominal cavity and peritoneum. These include:

- Omphalocele
- Gastroschisis
- Diaphragmatic hernia
- Obliterated peritoneal cavity and peritoneum membrane failure

B) Relative contraindications include:

- Pending abdominal surgery
- Previous major abdominal surgery
- Impending (<3months) living donor kidney transplantation.
- Lack of appropriate care giver at home to provide therapy
- Patient/caregiver choice for haemodialysis

The presence of a gastrostomy, colostomy, ureterostomy and/or pyelostomy does not preclude PD.

5.4 Pre-operative Investigations/Considerations prior to Tenckhoff Catheter Insertion (see appendix 1)

Not all investigations/considerations are necessary in children with HUS (haemolytic uraemic syndrome) / ARF (acute renal failure).

N.B. A home visit is required to ensure suitability of peritoneal dialysis at home.

- Prepare the child and family on peritoneal dialysis pre operatively.
- The need for a gastrostomy tube should be discussed at clinic. It is recommended that gastrostomy placement should preferentially take place before or at the time of PD insertion as abdominal surgery post tenckhoff surgery increases the risk of peritonitis. If required, refer patient to surgical team.
- Obtain a weight and height to calculate BSA.
- Take relevant bloods - liaise with nephrology team to check which bloods are required.
- Ensure MRSA, VRE and MRGNB screen is completed – not required for acute patients.
- Complete a nasal MRSA screen on the caregivers undertaking PD training.
- If child is positive for any of the above screens, contact the infection control team as screening maybe necessary for parents.
- Treat constipation as this can effect drainage problems on peritoneal dialysis. Administer laxatives as prescribed.

- Give antibiotic prophylactic cover within 60 minutes before the incision (do not administer if HUS).
 - Stat dose of IV Augmentin 30mgs/kg – max 1200mgs.
 - Note: where patients have had previous resistance to antibiotics other antibiotics maybe necessary. Consult with the microbiology team.
- Photograph displaying equipment lay out should be brought up to OT to avoid incorrect placement of equipment.
- Bring tenckhoff, minicap, clamp, titanium cap, peel away sheath and extension set to OT with patient (discuss with Nephrology team what size tenckhoff is required). Swan neck double cuffed catheters are the catheter of choice in TSH.

Size		Catheter	Code	Measurement from umbilicus to pubic bone
31cm		Neonatal PD catheter double cuff straight.	8888-414227	Neonates
38.9cm		Infant PD catheter swan neck curl catheter double cuff	8888-413100	Up to 7.5 cm
42cm		Paediatric PD catheter swan neck curl catheter double cuff	8888-414813	7.5 - 10.5cm
59cm		Paediatric swan neck curl catheter double cuff	8888-413102	10.5 - 14.5cm
62.2cm		Adult PD catheter swan neck curl catheter double cuff	8888-413807	14.5 - 17.5cm

- Preoperative peritoneal dialysis checklist must be completed (see appendix).

5.5 Peritoneal catheter choice:

The tenckhoff catheter remains the gold standard for PD access and is the most widely used in chronic dialysis. The use of a double cuff tenckhoff catheter with a downward or lateral subcutaneous tunnel configuration that is placed by a surgeon or nephrologist experienced in PD catheter placement is recommended. Double cuffed catheters are associated with a lower peritonitis rate than single-cuffed ones.

The location of the exit site should be determined in advance of the surgical procedure, and should be placed away from the belt line, from nappies and from stomas.

The catheter should be securely anchored close to the exit site to minimize movement and the potential risk for traction injury, which represents a risk factor for exit site infections.

The following table is a guide only and should be used in consultation with the surgeon / nephrologist inserting the tenckhoff:

Note: The measurements are based on the length between the inner cuff to the arch of coil of catheter.

5.6 Post-operative care of tenckhoff catheter insertion

a. Flushing the catheter

- **If the child's catheter has been inserted by a general surgeon, quick flushes are required:** the catheter should be flushed using the Claria machine with heparinised Physioneal 40 1.36%, 10ml/kg, to ensure no clots form in the peritoneal dialysis catheter. Preservative free heparin 500 iu/L is added to Physioneal 40 to prevent clots in the catheter. Heparin also has antiangiogenic and anti-inflammatory properties.
 - Do not exceed 10mls/kg of Physioneal 40 1.36% as this may alter healing of the PD exit site.
 - Continue flushing the catheter until PD fluid has turned rose or clear then discontinue flushes.
- **If the child's catheter has been inserted by the nephrologist, quick flushes are not required.**

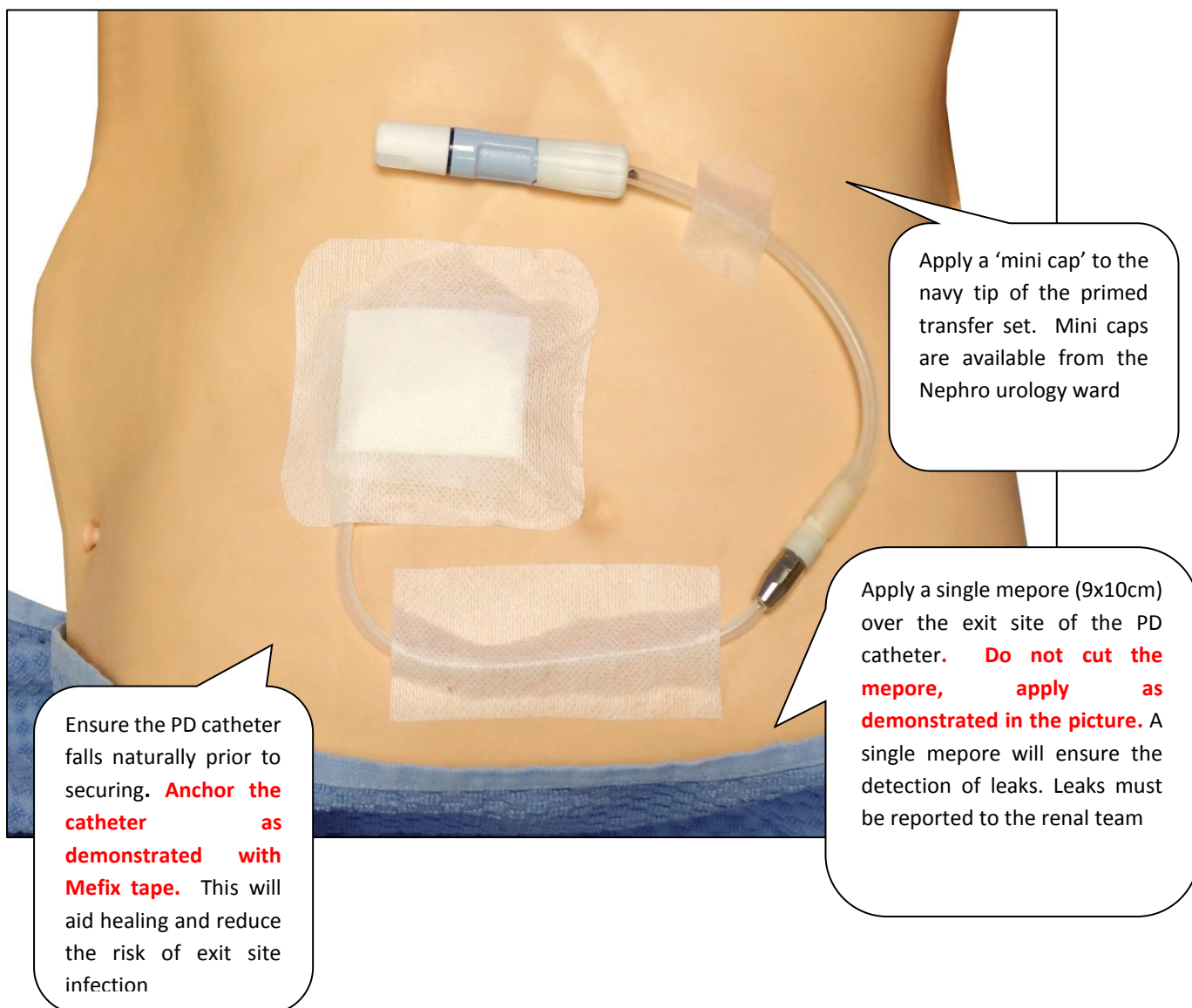
b. Wound site care

- Ideally the catheter should be left undisturbed after flushing, to allow the site to heal for 3-6 weeks. This cannot always be facilitated in patients with acute renal failure who need dialysis urgently. In this case, dialysis can start immediately post flushes (if general surgeons inserted the PD catheter) as per the Consultant Nephrologist.
- Observe the exit site dressing. The aim is to keep the exit site clean, dry, painless and non-inflamed. A non-occlusive dressing should be applied in OT, anchored with mefix to prevent trauma to the exit site and to optimize early healing. Leave the dressing undisturbed for 1 week. (See Figure 1)
- After one week, the exit site dressing should be changed using sterile technique. Once weekly dressings should continue until the exit site is healed, a minimum of 2-3 weeks although healing can take up to 6 weeks (ISPD 2012). The exit site is described as healed

when the skin around the exit site looks normal without gaping. Weekly dressing changes are advocated as more frequent changes require manipulation of the catheter which can increase the risk of trauma.

- Dressing changes should be performed more frequently only if excessive drainage is noted at the exit site or if excessive sweating causes wetness at the exit site.
- If it is felt that healing of the site is not progressing normally, a culture should be taken and daily cleaning will be required. Antibiotic treatment may be required.
- Chlorhexidine 0.5% (hydrex®) and normal saline 0.9% are suggested as suitable options to use as a cleaning agent.
- The patient should not shower or wet the dressing during the healing phase.

Figure 1



5.7 Peritoneal Dialysis Training

PD training should be performed by an experienced PD nurse with paediatric training. It should ideally occur on a 1:1 basis. A standardized teaching plan with learning objectives should be used. It is advised that 2 family members are trained. The uses of competencies are highly recommended. Hand washing is an extremely important aspect in PD training. Care givers should be taught to thoroughly wash their hands before any care procedures. It is paramount that the hands are dried completely with a clean towel as hand dampness after washing can cause bacterial translocation through touch contamination. Plain soap and water can be used for initial washing, then after an alcohol based gel should be applied. Parents should be educated about the importance of excluding animals from the room which dialysis is conducted (ISPD 2016).

5.8 Training Content

Theory	Practical	Complications	Other
Functions of the kidney	Handwashing	Signs, symptoms and treatment of peritonitis	Record keeping
Overview of PD	Aseptic non touch technique	Signs, symptoms and treatment of exit site and tunnel infections	Administration of medications
Fluid balance (weight and BP)	Dialysis therapy (step by step guide)	Drain problems (constipation, fibrin)	Dietary management
Different strengths of PD fluid	Emergency measures for contamination	Fluid balance (hypertension, hypotension)	Ordering and management of supplies
Prevention of infection	Troubleshooting	Other (leaks, pain)	Managing life with PD (school, sport, holidays)
	Blood pressure and weight monitoring		Contacting the hospital, making clinic visits
	Exit site care		
	Manual drain		

5.9 Discharging a patient on peritoneal dialysis

All home visits are carried out by the renal CNSp

- 1st home visit is carried out pre operatively to ensure suitability and storage of equipment. Any necessary alterations must be made if necessary.
- 2nd home visit is carried out pre discharge, if alterations are required, to ensure that they are completed and appropriate to carry out home PD.
- 3rd home visit is carried out on first night on home PD.
- 4th home visit is recommended at 6 weeks at the discretion of the PD nurse specialist.

The renal nurse specialist plans the duration and timing of training programme and it is usual that 2 family members attend. Estimated training time is 2 weeks.

Ensure peritoneal dialysis discharge checklist is carried out before discharge.

6.0 CONTINUOUS REVIEW

This policy and procedure shall be reviewed and updated at least every two years by the Author/and or Owner in order to determine its effectiveness and appropriateness. It shall be assessed and amended as necessary during this period to reflect any changes in best practice, law, substantial organisational change and professional or academic change.

7.0 AUDIT AND EVALUATION

In order to ensure the effectiveness of this policy and procedure the Author/and or Owner shall complete an audit annually to review and monitor compliance with this policy and procedure. The Author/and or Owner must further provide a systematic process for the reporting and investigation of compliance breaches, or potential breaches, to enable proactive prevention in the future.

8.0 KEY STAKEHOLDERS

The following Key Stakeholders were consulted/involved in the development of this document:

NAME	TITLE
Dr Atif Awan	Consultant Nephrologist
Dr Michael Riordan	Consultant Nephrologist
Dr Clodagh Sweeney	Consultant Nephrologist
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Grainne Doran	Renal CNS
Marie McNicholas	Renal CNS

9.0 REFERENCES

Warady B., Bakkaloglu S., Newland J., Cantwell M., Verrina E., Neu A., Chadha V., Yap, H. and Schaefer, F. (2012) Consensus Guideline for the prevention and treatment of catheter-related infections and peritonitis in pediatric patients receiving peritoneal dialysis: 2012 update. *International Society for Peritoneal Dialysis*. Vol. 32, pp32-86.

Kam-Tao, P., Szeto, C., Piraino, B., de Arteago, J., Fan, S., Figueiredo, A., Fish, D., Goffin, E., Kim, Y., Salxer, W., Struijk, D., teitelbaum, I. and Johnson, D. (2016) ISPD peritonitis recommendations: 2016 Update on prevention and treatment. *Journal of the international society for peritoneal dialysis*. Vol.36 (5), 481-508.

10.0 APPENDICES

Appendix 1 - Pre Operative Peritoneal Dialysis Checklist

Appendix 2 - Claria Set up

Appendix 3 - Connection and Disconnection



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Appendix 1

Addressograph

Pre-operative peritoneal dialysis catheter insertion checklist

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
Height in cms			
Weight in kgs Date weighed _____			
MRSA screen completed			
Hibiscrub body wash completed			
If required, have laxatives been given? If so, has it been given with good effect?			
IV antibiotics given 60 minutes pre-operatively?			
Parental nasal MRSA screen completed?			
Peritoneal dialysis equipment, Tenckhoff, minicap, clamp, titanium cap and extension set to accompany patient to OT			
Photograph demonstrating set up of equipment to accompany patient			

Date completed _____

Signature _____

Grade _____

NMBI no. _____

Counter signature _____

Grade _____


NMBI no. _____



Appendix 2

Claria set up

Step 1 – PREPARE

- Prepare/tidy your area. Turn machine on.
- Machine will read 'Connecting to network...'
- Gather equipment.
- Wash hands for 30secs with hibiscrub. Dry thoroughly.
- Clean machine (excl cassette) and work surface with azowipes
- Follow machine prompt to enter weight and BP. Press red button.
- Machine will read 'PRESS GO TO START'. **Do not** press go.
- Press  and select 'CHANGE PROGRAM' to review programme.
- Press **red** button when satisfied program is correct.

Step 2 – OPEN EQUIPMENT

- Decontaminate hands with alcohol gel .
- Check dialysis bag/s, extraneal bag, cassette and drainage bag and any other equipment needed (e.g. sample bag, drain manifold, and empty heater bag) while in packaging for:
 - a) Volume b) Expiry date c) Concentration
- Open up packaging of dialysis bags, cassette, drainage bag and any other equipment you may need and **leave in packaging**. Check for:
 - a) Solution is clear b) Leaks c) Seals are intact
- Machine will read "PRESS GO TO START". Press **green** button – machine will confirm standard or low fill mode (press **green** button) and prompt to mix two chamber bag (press **green** button).
- The machine will read "LOAD THE SET".

Step 3 – LOADING THE SET

- Decontaminate hands with alcohol gel.
- Place dialysis bags on clean surface and break seals of dialysis bags.
- Place dialysis bag with blue seal upwards / empty heater bag on heater plate. Do not stack bags.
- Close clamps of cassette, open door of machine, pick up and load the cassette.
- Pick up drainage bag, close clamps, put long waste line inside folded bag and place below machine.
- Press **green** button-machine will read "SELF TESTING" - then reads - "CONNECT BAGS".

Step 4 – CONNECTING BAGS

- Decontaminate hands with alcohol gel.
- Pick up heater line (red line) and attach to heater bag, using ANTT. Continue process for remainder of bags.
- If patient is for a last bag fill of different solution, ensure you attach the blue line to this bag. Ensure you **break seal** of Extraneal.
- Using same process, attach waste line to drainage bag.
- If sample bag or drain manifold is needed attach it at this point to the waste line sample line.
- After connecting all lines, open clamps on lines in use only. Clamp line on outlet tube of drainage bag.
- Press **green** button-machine will read "PRIMING" – then reads "CONNECT YOURSELF"

Equipment

- Azowipes
- Prescription
- Trolley
- Physioneal fluid/Extraneal fluid
- Drainage bag
- Cassette
- Sample bag /empty heater bag/ drain manifold if required
- Disposable hand towel
- Alcohol gel
- Connection shield if required

Points to remember

- Low fill mode – under 1000ml fill.
- Standard mode – over 1000ml fill.
- Standard Sets – over 300mls fill volume
- Min drain time = 3min added to 1min for every 100 ml fill.
- Min drain volume = 85%



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Appendix 3

Connection and Disconnection from Homechoice Machine

Connection

- Record BP and weight.
- Gather equipment (alcohol gel, azowipes, connection shield).
- Wash hands for 30 seconds using hibiscrub. Dry thoroughly.
- Re-prime if any air in patient line.
- Open connection shield
- Decontaminate hub of tenckhoff catheter by thoroughly cleaning with azowipe.
- Decontaminate hands using alcohol gel for 15 seconds.
- Remove patient line from organiser, remove blue ring pull and apply connection shield at this point and connect to patient line using ANTT.
- Note - Remove tenckhoff minicap last to minimise navy tip exposure.
- Press **green** button, when initial drain appears on machine, open tenckhoff clamp.

Disconnection

- Ensure you are bare below elbow and tie back hair.
- Clean area with azowipes.
- Place unopened minicap on clean trolley.
- Record information. Machine will read "END OF THERAPY".
- Press  - record "INITIAL DRAIN".
- Press  - record "LAST UF".
- Press  - record "AVERAGE DWELL TIME".
- Press  record "LOST DWELL TIME" or rarely "ADDED DWELL TIME"
- Press **green** button- Machine reads "CLOSE ALL CLAMPS" but don't yet!
- Perform 30 second hand wash with hibiscrub and dry hands thoroughly with disposable towel.
- Clamp patient line first, then all other lines.
- Press **green** button – Machine reads "DISCONNECT YOURSELF".
- Decontaminate hands with alcohol gel x 15seconds. Ensure they dry thoroughly.
- Open minicaps, leave in packaging.
- Decontaminate hub of tenckhoff catheter by thoroughly cleaning with azowipe.
- Decontaminate hands with alcohol gel x 15 seconds. Ensure they dry thoroughly.
- Disconnect patient line and apply minicap.
- Press **green** button, machine reads "REMOVE CASSETTE", do so and press **green** button; reads "CONNECTING TO NETWORK" and then "TURN ME OFF". Turn machine off and dispose of dialysate appropriately.
- Record BP and weight



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