



Peritoneal Dialysis Catheter Exit Site Care and Management Guideline

1. Purpose

This guideline will provide WA Country Health Service (WACHS) medical and nursing clinicians with information on how to care and manage the Peritoneal Dialysis (PD) catheter exit sites of adult PD patient's presenting to WACHS regional hospitals, health centres or nursing posts.

PD is a self-care treatment option for patients with end stage kidney disease (ESKD) and includes Continuous Ambulatory Peritoneal Dialysis (CAPD) and Automated Peritoneal Dialysis (APD). CAPD is usually performed four times a day taking approximately 30 minutes to complete each exchange. APD involves the use of an automated cyclor to perform fluid exchanges overnight while the patient sleeps.

PD patients and/or their carers are trained to perform the regular care and maintenance of their PD catheter exit site during their PD training program. Outpatient PD training, support and care in WA is provided and coordinated by an externally contracted [Renal Home Therapies \(RHT\) team](#). WACHS Regional Renal Support Teams are established in most WACHS regions and facilitate the provision of outpatient care for PD patients in collaboration with the RHT team.

This guideline can be read in conjunction with;

- WACHS [Peritoneal Dialysis Associated Peritonitis - Assessment, Treatment and Management Guideline](#)
- WACHS [Peritoneal Dialysis Intra-Peritoneal Medications - Preparation and Administration Procedure](#)

2. Guideline

PD patients may present to WACHS regional hospitals, health centres or nursing posts with a PD associated complication (i.e. peritonitis or PD catheter exit site infection) or a non-PD related presentation. PD catheter exit site and tunnel infections are associated with an increased risk of PD associated peritonitis, therefore prompt identification and treatment is important.

As part of their RHT training, PD patients are advised to notify the RHT team if they have complications with their PD treatments (i.e. suspected PD catheter exit site infection). The RHT team will determine the need for the patient to present to their local ED for further assessment and management. If ED presentation is required, the RHT team will inform the ED of the patient's presentation and advise the suggested management plan. PD patients may present to ED without notifying the RHT team prior. In this case the RHT team should be notified by the ED to provide guidance and support on management of PD catheter exit site infection required.

PD catheter exit site care and management can be determined and implemented following the recommendations within this guideline and in consultation with the with the [RHT team](#) and Nephrologist/On-call Renal Specialist that provides medical governance and support

to their WACHS region. See [WACHS Renal Services Intranet Page](#) for the WACHS regions' tertiary alignments. Recommendations within this guideline for the care and management of PD patients' catheter exit sites and PD catheter-related infection complications have been made in line with the [International Society for Peritoneal Dialysis \(ISPD\) Catheter-related infection guideline recommendations](#).

Guidelines are designed to provide staff with evidence-based recommendations to support appropriate actions in specific settings and circumstances. As such, this guideline should be followed in the first instance where practical. In the clinical context, where a patient's management should vary from this guideline, this variation and the clinical opinion as to reasons for variation should be documented in accordance with Clinical Practice Standards.

2.1 Routine assessment, classification and care

Assessment and classification

Assessing and classifying PD catheter exit sites based on appearance and specific characteristics aids in early diagnosis, prevention, and effective treatment of PD catheter exit site and/or tunnel infections. Assessment should be incorporated into routine PD catheter exit site care, including:

- visual inspection of both the external PD catheter exit site and catheter sinus tract (tunnel)
 - external exit site can be seen without lifting the catheter
 - to view the outermost part of the catheter tunnel, the catheter must be lifted gently
- palpation of the tunnel and superficial cuff for induration and tenderness
- compare findings with previous PD catheter exit site appearance
- use a PD catheter exit site classification guide to rate the exit site. Refer to [Appendix A Classification of PD Catheter Exit Site Guide](#).
- culture any obvious drainage.

Routine care

PD patients have received training from the RHT team to attend to their own PD catheter exit site care and this should be encouraged. Assistance may be required if the patient is hospitalised and acutely unwell or in increased pain.

Basic principles of PD catheter exit site care:

- use of Bactroban®/mupirocin for the life of the catheter for the prevention of MRSA
 - site, frequency and duration of Bactroban®/mupirocin treatment can vary and is guided by each patient's primary Nephrologist
 - options for Bactroban®/mupirocin treatment can include:
 - intranasal once a week; or
 - daily topical application to the exit site.
- the PD catheter exit site should be covered and kept dry
- daily cleaning and assessment of the PD catheter exit site is essential for the prevention of exit site infection
- the PD catheter anchor tape should always be in place to prevent trauma
- anchor the PD catheter in its natural position and do not pull tight
- additional PD catheter exit site care should be attended after exercise, swimming and if dressing becomes loose

- avoid tight clothing or belts that will apply pressure over the PD catheter exit site
- talcum powder or lotions should not be applied to the PD catheter exit site
- crusts or scabs should not be forcibly removed
- sharp items (i.e., scissors) should not be used to remove tape or dressing as may risk cutting catheter.

[Appendix B](#) details the appropriate steps to be taken to care for a routine PD catheter exit site.

2.2 PD catheter-related infections

Types of infections that can occur:

- An exit site infection (ESI) is a clinically apparent infection at the PD catheter exit site.
- An untreated ESI can occur on its own and may also be a precursor for a tunnel infection.
- A tunnel infection can occur between the internal cuffs of a PD catheter and can occur on its own or concurrently in the presence of an ESI.
- Exit site and tunnel infections may lead to peritonitis and subsequent catheter loss (i.e. removal), therefore early diagnosis and management is essential.

A summary flowchart is available in [Appendix C](#) for the management of PD catheter-related infections.

Assessment

Follow assessment process described in [section 2.1. Routine assessment, classification and care](#). Table 1 summarises signs and symptoms of PD catheter ESIs and tunnel infections that may be present upon assessment.

Table 1. Signs and symptoms of PD catheter ESIs and tunnel infections

Location	Signs and Symptoms of Infection
Exit Site	<ul style="list-style-type: none"> • Purulent discharge from the PD catheter exit site. • Swelling and erythema surrounding the PD catheter exit site may be present. • Pain may be present when palpating.
Tunnel	<ul style="list-style-type: none"> • Erythema, oedema and/or tenderness over the subcutaneous pathway of the PD catheter. • Purulent or bloody drainage that discharges spontaneously or after applying pressure on the cuff. • Possible peri-catheter fluid collection.

Diagnosis

The following points outline various methods for diagnosis:

- If a PD catheter exit site shows signs of infection, a swab of the exit site should be taken and sent to pathology for microscopy, culture, and sensitivities (MC&S).
- For any discharge that is present from the tunnel upon palpation during assessment, a swab should be taken and sent to pathology for MC&S.
- If there is purulent discharge that can be drained from either the PD catheter exit site or tunnel, Gram stain of the drainage can be used to guide treatment.

- Peri-catheter fluid collection can be confirmed via ultrasound examination. Other indications for PD catheter tunnel ultrasound examination could include:
 - Staphylococcus aureus (*S. aureus*) ESI even without symptoms of tunnel infection.
 - relapsing peritonitis episodes
 - follow-up of combined PD catheter ESI and tunnel infection one week after completion of antibiotic treatment.
- Notify the [RHT team](#) and appropriate [Nephrologist/On-call Renal Specialist](#) of the patient's presentation and condition to receive guidance for ongoing care and management (i.e., PD catheter exit site review dates, treatment duration and antibiotic choice).

Exit site care

PD catheter exit site care should be performed a minimum of daily. A routine PD catheter exit site care procedure is detailed in [Appendix B](#).

Modifications or additions to the routine procedure during infection may require adjunctive treatments including:

- topical chlorhexidine 0.1% solution cleansing (replaces normal saline)
- topical Bactroban®/mupirocin to the exit site
- silver ion-based dressing
- silver nitrate cauterisation.

Guidance should be sought from the [RHT team](#) and [Nephrologist/On-call Renal Specialist](#) prior to changing the patient's routine PD catheter exit site care.

Antibiotic treatment

Initial antibiotic treatment includes:

- Empiric antibiotic treatment of an ESI and/or tunnel infection with appropriate *S. aureus* coverage is recommended whilst awaiting swab results.
- Suggested oral empiric antibiotic therapy includes:
 - oral flucloxacillin 500 mg QID for a minimum of two weeks or;
 - oral cefalexin 250 to 500 mg QID for a minimum of two weeks (alternative option if patient has a non-immediate hypersensitivity to penicillin)
- Recommended alternative if the patient has prior history of methicillin-resistant *S. aureus* (MRSA) includes:
 - intra-peritoneal (IP) vancomycin 2 g every 3 to 7 days when level <15 mg/L. If levels not readily available repeat dose once weekly. Continue for at least three weeks. Note: IP medications must be prepared and instilled into the PD dialysate using aseptic technique. Refer to WACHS [Peritoneal Dialysis Intra-Peritoneal Medications - Preparation and Administration Procedure](#)
- If the patient has a history of Pseudomonas infection or colonisation, empiric treatment should also include oral ciprofloxacin 500 mg nocte for three weeks.
- Concomitant antifungal prophylaxis should be prescribed whenever patients receive antibiotics for any reason to mitigate risk of fungal peritonitis. Recommended antifungal prophylaxis includes:
 - oral nystatin 500,000 units 1 tablet/capsule QID for duration of antibiotic therapy, plus one additional week post antibiotic completion.

Subsequent antibiotic treatment duration and monitoring considerations include:

- Ongoing antibiotic treatment and duration should be adjusted according to clinical response, swab culture and sensitivities.
 - Advice should be sought from Nephrologist/On-call Renal Specialist and Infectious Disease Physician as needed.
- An ESI should be treated with a two-week antibiotic duration.
- An ESI caused by Pseudomonas species should be treated with at least three weeks of effective antibiotics.
- Tunnel infections should be treated with at least three weeks of antibiotics.
- Recommended treatment durations should count from the day of effective antibiotics.

If IP vancomycin is used as treatment, ensure:

- a plan is in place for IP antibiotic preparation and instillation into patient's PD dialysate in the community
 - each region may have different resources and arrangements in place for IP antibiotic preparation and instillation i.e., regionally based RHT nurse or Hospital in the Home (HITH).
- a schedule is in place for vancomycin plasma levels to monitor for adequacy and non-toxicity.

2.3 Other considerations and management

If at any time the patient's PD effluent (i.e. drain fluid) becomes cloudy, peritonitis should be suspected. Refer to WACHS [Peritoneal Dialysis Associated Peritonitis - Assessment, Treatment and Management Guideline](#).

Removal of the PD catheter may be necessary in patients with PD catheter ESI or tunnel infection that progresses to or occurs simultaneously with peritonitis due to the same organism.

Catheter related infections that fail to completely resolve after the recommended antibiotic course duration can be defined as refractory catheter related infection and may require surgical intervention or catheter removal.

Decisions related to catheter removal are made in collaboration with the RHT and the Nephrologist/On-call Renal Specialist

3. Roles and Responsibilities

WACHS staff are required to work within their identified scope of practice, level of experience and work role.

WACHS medical and nursing clinicians will have varied roles and responsibilities in implementing this guideline dependent on their scope of practice. These include:

The **Nephrologist/On-call Renal Specialist** is responsible for:

- providing medical oversight and support to WACHS medical and nursing clinicians providing care to patients with PD catheter exit site or tunnel infections.

The **Medical Officer (MO)** is responsible for:

- assessment and diagnosis of suspected infected PD catheter exit site and/or tunnel

- follow-up and review of microbiology results
- consultation with Nephrologist/On-call Renal Specialist and/or infectious disease physician
- selection and prescribing of medications.

The **Registered nurse (RN)** is responsible for:

- PD catheter exit site assessment and routine exit site care and management as required
- identification of infected PD catheter exit site and/or tunnel, and notification to MO
- liaising with MO, RHT team and Nephrologist/On-call Renal Specialist to formulate treatment plan
- preparation and administration of prescribed medications as required
- coordination of follow-up plan in consultation with RHT team.

As detailed in the state-wide RHT contract, the **Renal Home Therapies (RHT) team** roles and responsibilities include:

- providing training and clinical support for PD patients to attend to their own PD catheter exit site care
- providing patient information (i.e., PD regimen, history of ESI and/or tunnel infection)
- liaising with MO and RN to provide guidance for treatment, ongoing care and management
- support, coordinate and manage outpatient follow-up and monitoring.

All staff are required to comply with the directions in WACHS policies and procedures as per their roles and responsibilities. Guidelines are the recommended course of action for WACHS and staff are expected to use this information to guide practice. If staff are unsure which policies procedures and guidelines apply to their role or scope of practice, and/or are unsure of the application of directions they should consult their manager in the first instance.

4. Monitoring and Evaluation

Monitoring of compliance to this guideline is to be undertaken bi-monthly by the WACHS Renal Services Team and WACHS Renal Governance Group through:

- review of patient safety and quality data including clinical incidents and consumer feedback related to PD catheter-related infections.

This guideline will be reviewed as required to determine effectiveness, relevance and currency. At a minimum it will be reviewed every three years by the WACHS Renal Services Team and the WACHS Renal Governance Group.

5. References

Baxter PD Academy. [Management of exit-site infection](#) [Internet]. 2022 August [cited 2023 July 19].

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Twardowski ZJ, Prowant BF. [Current approach to exit-site infections in patients on peritoneal dialysis](#). Nephrol Dial Transplant [Internet]. 1997 [cited 2023 July 19];12(6):1284-1295.

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6. Definitions

Term	Definition
Clinician	A qualified healthcare professional who provides direct patient care e.g. medical officers (MO) and registered nurses (RN)
Dialysate	An electrolyte, buffer and dextrose solution used to draw waste products and extra fluid out of the blood. Can be referred to as PD fluid.
Effluent	The drained dialysate fluid that has dwelled in the patient. It contains waste products and excess fluid from the patient.
End Stage Kidney Disease	End Stage Kidney Disease (ESKD) is the stage of chronic kidney disease (CKD) when a person’s kidney function cannot sustain their wellbeing, requiring some form of treatment to maintain life.
Exit site	Point at which the PD catheter exits the body which includes the most external part of the sinus tract and surrounding skin.
Nephrologist	Senior physician specialised in renal medicine providing diagnosis and management of kidney disease.
On-call Renal Specialist	Senior medical officer (registrar or advanced trainee) specialised in renal medicine providing out-of-hours medical oversight and governance of renal patients.
PD catheter	A small flexible tube surgically placed in the abdomen that allows dialysate to move in and out of the peritoneal cavity. Internal cuffs keep the catheter in place,

	preventing fluid leakage and infection. May also be referred to as Tenckhoff catheter.
Peritoneal Dialysis	Peritoneal Dialysis (PD) is a treatment option for patients with ESKD which uses the peritoneum as a semipermeable membrane to remove excess toxins and fluid from the patient's blood.
Peritonitis	An infection of the peritoneal membrane lining the peritoneal cavity. It is a serious complication of peritoneal dialysis (PD) which occurs when bacteria enter the peritoneal cavity.
Refractory catheter related infection	Catheter related infections that fail to completely resolve after the recommended antibiotic course duration
Regional Renal Support Team	Regional Renal Support Team (RRST) is the multidisciplinary team providing outpatient renal support services focused on early detection, primary and secondary prevention, and management of chronic kidney disease (CKD).
Renal Home Therapies	Home Therapies includes Home Haemodialysis (HHD), Continuous Ambulatory Peritoneal Dialysis (CAPD), Automated Peritoneal Dialysis (APD) and Community Supported Home Haemodialysis (CSHD).
Renal Home Therapies team	Renal Home Therapies (RHT) team are renal clinicians from an external provider contracted by WACHS to provide renal home therapies including training to the patient and their carer, equipment, consumables, technical and clinical support.
Tunnel	Area created by the catheter position under the skin between the PD catheter exit site and the point of entry into the peritoneal cavity. Located between the internal and external cuffs.

7. Document Summary

Coverage	WACHS wide
Audience	Any WACHS clinician providing direct patient care to PD patients presenting to WACHS health facilities
Records Management	Clinical: Health Record Management Policy
Related Legislation	Health Services Act 2016 (WA)
Related Mandatory Policies / Frameworks	<ul style="list-style-type: none"> • MP 0131/20 High Risk Medication Policy • MP 0078/18 Medication Chart Policy • MP 0104/19 Medication Review Policy • Clinical Governance, Safety and Quality Policy Framework
Related WACHS Policy Documents	<ul style="list-style-type: none"> • Aseptic Technique Policy • Hand Hygiene Policy • High Risk Medications Procedure • Medication Prescribing and Administration Policy • Peritoneal Dialysis Associated Peritonitis - Assessment, Treatment and Management Guideline • Peritoneal Dialysis Intra-Peritoneal Medications - Preparation and Administration Procedure
Other Related Documents	<ul style="list-style-type: none"> • CAPD Fresenius Stay•safe® procedure
Related Forms	<ul style="list-style-type: none"> • MR170A WA Hospital Medication Chart – Short Stay
Related Training Packages	Nil
Aboriginal Health Impact Statement Declaration (ISD)	ISD Record ID: 3499
National Safety and Quality Health Service (NSQHS) Standards	2.06; 2.07; 3.05; 3.10; 3.11; 3.12; 3.14; 3.18; 4.04; 6.09
Aged Care Quality Standards	Nil
National Standards for Mental Health Services	Nil
Other Standards	Nil

8. Document Control

Version	Published date	Current from	Summary of changes
1.00	19 November 2024	19 November 2024	New guideline


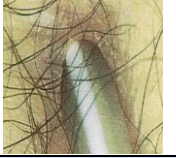


9. Approval

Policy Owner	Executive Director of Clinical Excellence
Co-approver	Executive Director Nursing and Midwifery Services
Contact	Clinical Nurse Consultant – Renal
Business Unit	Population Health
EDRMS #	ED-CO-24-316661

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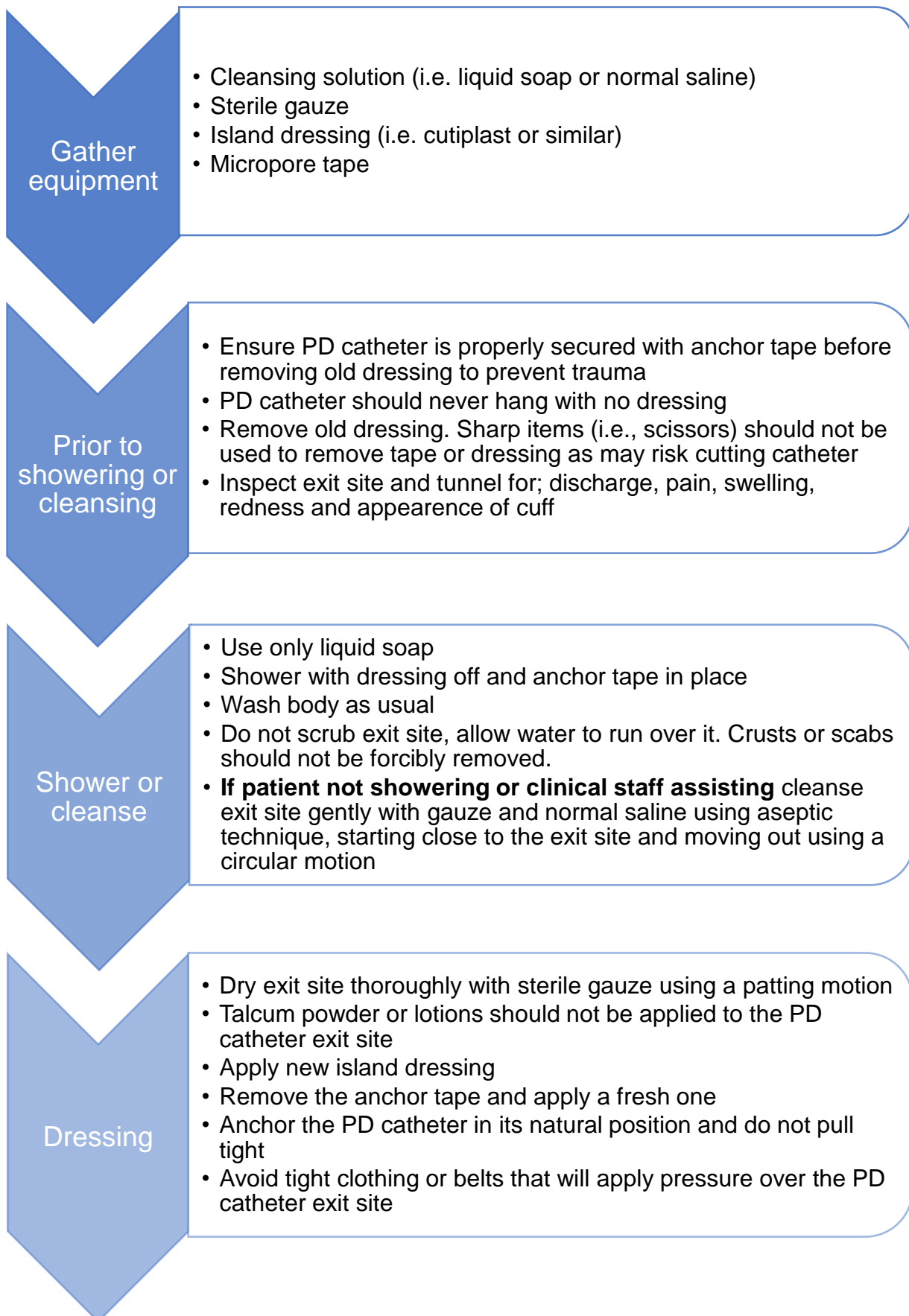
This document can be made available in alternative formats on request.

Appendix A: Classification of PD catheter exit site guide

Classification of PD Catheter Exit Site					
Sign/ Symptom	Perfect	Good	Equivocal	Acute Infection < 4 weeks	Chronic Infection > 4 weeks
					
External					
Pain or tenderness	None	None	None	May be present	Only if exacerbation. May be present over cuff
Colour	Natural, pale pink or dark	Natural, pale pink, purplish or dark, bright pink < 13 mm	Bright pink or red < 13 mm	Bright pink or red > 13 mm	Bright pink or red >13 mm only if exacerbation
Crust	None	None	Present, may be large or difficult to detach	Present	Present, may be difficult to detach
Scab	None	None	None	May be present	May be present
Drainage	None	None	None even with pressure on sinus. Dried exudate on dressing	Purulent or bloody. Spontaneous or after pressure on sinus. Wet exudate on dressing	Purulent or bloody. Wet exudate on dressing
Swelling	None	None	None	May be present	Occurs only if exacerbation
Granulation Tissue	None	None	Plain or slightly exuberant	Slightly exuberant or proud flesh may be present	Proud flesh or slightly exuberant typically visible
Sinus					
Epithelium	Strong, mature. Covers visible sinus	Strong, mature at rim. Fragile or mucosal deeper	Absent or covers part of sinus	Absent or covers only part of sinus	Absent or covers only part of sinus
Granulation Tissue	None	Plain beyond epithelium	Slightly exuberant	Slightly exuberant or proud flesh	Proud flesh or slightly exuberant
Drainage	None or barely visible. Clear or thick	None or barely visible. Clear or thick	Purulent or bloody. May be serous in nature	Purulent or bloody	Purulent or bloody

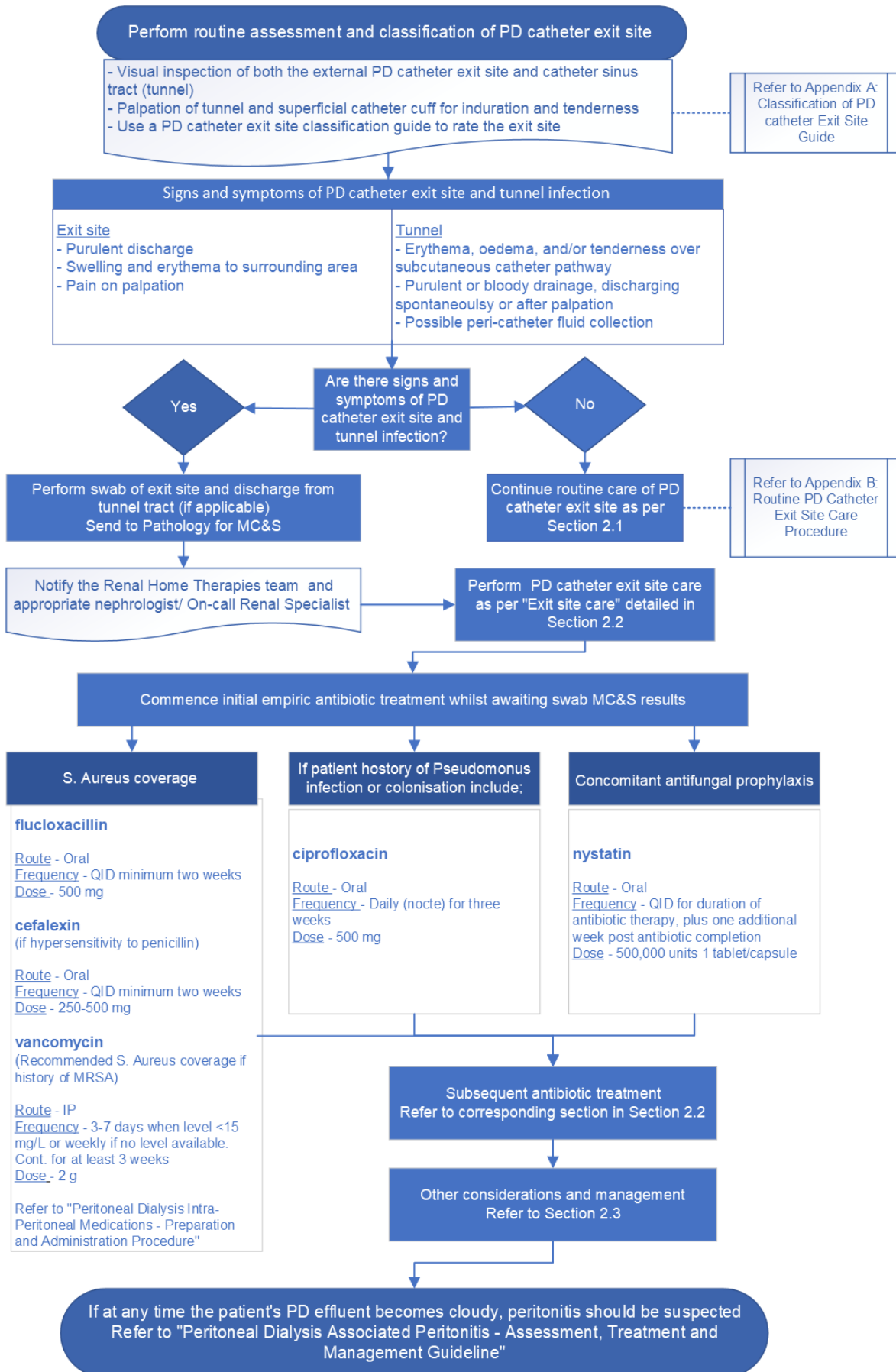
Adapted from: Twardowski and Prowant (1997); BC Renal (2020).

Appendix B: Routine PD catheter exit site care procedure



Adapted from: WA Home Dialysis Program (WAHDiP) (2013)

Appendix C: Management of PD catheter-related infections flowchart



Adapted from: WA Home Dialysis Program (WAHDiP) (2013)