PERITONEAL DIALYSIS (PD) – PERITONITIS MANAGEMENT AND TREATMENT

<table>
<thead>
<tr>
<th>Cross References</th>
<th>NSW Health PD2013_043 Medication Handling in NSW Public Health Facilities</th>
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<tr>
<td></td>
<td>NSW Health PD2017_013 Infection Prevention and Control Policy</td>
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<td>NSW Health PD2014_050 Principles for the Management of Tuberculosis in New South Wales</td>
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<td>NSW Health PD2016_058 User applied Labelling of Injectable Medicines, Fluids and Lines</td>
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<td>Australian Commission on Safety and Quality in Health Care National Standard for User-applied Labelling of Injectable Medicines, Fluids and Lines</td>
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<td>SESLHDPD/271_Aseptic Technique</td>
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<td>SGH-TSH CLIN027 Aseptic Technique - Competency and Education Requirements</td>
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<td>SGH CLIN Peritoneal Dialysis (PD) Catheter Infection – Exit Site and Tunnel Infection Management and Treatment</td>
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<td>SGH CLIN Peritoneal Dialysis (PD) – Nasal Swab And Mupirocin</td>
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<td>PD SGH WPI 145 Peritoneal Dialysis – Fluid Specimen Collection via CAPD Freeline Solo Exchange</td>
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<td>PD SGH WPI 146 Peritoneal Dialysis – Fluid Specimen Collection via Automated PD (APD)</td>
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**SGH Renal Department:**

SGH CLIN Peritoneal Dialysis – Intraperitoneal Ampicillin Administration (250 mg)

SGH CLIN Peritoneal Dialysis – Intraperitoneal Cefepime (1g)

SGH CLIN Peritoneal Dialysis – Intraperitoneal Ceftazidime (1g)

SGH CLIN Peritoneal Dialysis – Intraperitoneal Ceftazidime Administration (250 mg)

SGH CLIN Peritoneal Dialysis – Intraperitoneal Fluconazole

SGH CLIN Peritoneal Dialysis – Intraperitoneal Gentamicin Administration (40 mg)

SGH CLIN Peritoneal Dialysis – Intraperitoneal Vancomycin Administration

SGH CLIN Peritoneal Dialysis – Intraperitoneal Cefazolin (1g)

SGH CLIN Peritoneal Dialysis – Intraperitoneal Cefazolin (250 mg)

<table>
<thead>
<tr>
<th>1. What it is</th>
<th>A guideline and procedure for the early diagnosis of peritonitis and timely management with antimicrobial therapy according to best practice guidelines</th>
</tr>
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<tr>
<td>2. Risk Rating</td>
<td>Medium</td>
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<tr>
<td>3. Employees it Applies to</td>
<td>Registered Nurses (RN) Medical Officers (MO)</td>
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<tr>
<td>4. Process</td>
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Peritonitis is one of the main complications of PD. Early diagnosis, rapid intervention and treatment with antimicrobial therapy are necessary measures to prevent further complications and peritoneal membrane failure.

**Definitions**

- **Peritonitis**: Inflammation of the peritoneum, typically caused by bacterial infection.
- **Recurrent peritonitis**: Peritonitis episode that occurs within 4 weeks of completion of therapy of a prior episode but with a different organism.
- **Relapsing peritonitis**: Peritonitis episode that occurs within 4 weeks of completion of therapy of a prior episode with the same organism.
- **Repeat Peritonitis**: Peritonitis episode that occurs more than 4 weeks after completion of therapy of a prior episode with the same organism.
- **Refractory Peritonitis**: Failure of the PD effluent to clear after 5 days of appropriate antibiotics.
- **Catheter-related Peritonitis**: Peritonitis in conjunction with an exit-site or tunnel infection with the same organism.

### 4.1 DIAGNOSING PERITONITIS

- The presence of at least 2 of the following clinical signs and symptoms to confirm peritonitis:
  - Cloudy peritoneal effluent and/or abdominal pain (may or may not be accompanied by constipation or diarrhoea, fever, nausea and/or vomiting)
  - Peritoneal dialysate microscopy should demonstrate white cell count (WCC) > 100 x 10^6/L with > 50% polymorphonuclear (PMN) neutrophils (after a PD fluid dwell time of 2 hours)
  - Note: For patients using automated peritoneal dialysis, >50% PMN is a strong indicator of peritonitis, even if total WCC is below 100 x 10^6/L
  - Demonstration of bacteria on gram stain culture (although this is not required to make the diagnosis)

### 4.2 MANAGEMENT OF PERITONITIS PRESENTATION (refer to Treatment Flowchart 3 Appendix 3)

**Note**: PD catheter connection and exit site swab and/or dressing can be performed by (or under the supervision of) an accredited staff only.

1. Upon patient presentation, collect PD fluid specimen for microscopy, culture, sensitivities (MCS), cell count and cell differential preferably before any antibiotic treatment is given as per PD SGH WPI 145 Peritoneal Dialysis – Fluid Specimen Collection via CAPD Freeline Solo Exchange or PD SGH WPI 146 Peritoneal Dialysis – Fluid Specimen Collection via Automated PD (APD)

**Note**: If patient was given antibiotic/s prior to PD fluid specimen collection, note down all the antibiotics patient received on the pathology request form.

2. Review PDC exit site and swab for MCS as per SGH CLIN Peritoneal Dialysis (PD) Catheter Infection – Exit Site and Tunnel Infection Management and Treatment
3. Notify renal consultant and team to review patient during office hours or inform on-call renal consultant/registrar after-hours. Patients manifesting clinical signs and symptoms of peritonitis must commence empirical antibiotic treatment immediately.

4. Symptomatic patient receiving empirical antibiotic treatment must be admitted (preferably in 4 South renal ward) for ongoing treatment.

5. Notify PD CNC (page 1091) and PD unit (ext. 33770) of hospital admission.

6. PD nurse to conduct a root cause analysis for any PD related infective episode, including a review of patient/carer’s dialysis technique and hand hygiene practices. PD nurse to provide PD retraining as required.

4.3 RECOMMENDED EMPIRIC ANTIBIOTIC THERAPY AND MANAGEMENT BEFORE ORGANISMS KNOWN (Refer to Treatment Flowchart 3 Appendix 3)

1. Initiate antimicrobial treatment as soon as possible after obtaining PD fluid specimen.

2. Stat intraperitoneal (IP) administration of:
   a) Cefepime 1g daily in a PD fluid bag as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Cefepime (1g) or Cefazolin 1g (dwell for 6 hrs) and Gentamicin 40mg in one bag as an alternative if patient considered high risk of staphylococcal infection or unwell. Continue with IP cefazolin 250mg in each CAPD bag for 4 × CAPD exchanges a day and IP gentamicin 40mg in one bag.
   b) Patients with history of chronic gastrointestinal condition and inflammation and/or patients with history of Pseudomonas or gram negative organism infection: Consider a dual empiric therapy of cefepime 1g and gentamicin 40mg combined in a PD fluid bag daily as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Cefepime (1g) and SGH CLIN Peritoneal Dialysis – Intraperitoneal Gentamicin Administration (40 mg)
   c) Patients with history of MRSA: vancomycin 30mg/kg (maximum 2g) every 5-7 days depending on therapeutic level, and gentamicin 40mg combined in a PD fluid bag daily as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Gentamicin Administration (40 mg) and SGH CLIN Peritoneal Dialysis – Intraperitoneal Vancomycin Administration

   Note: Monitor gentamicin level after every 3rd dose.

3. Dwell IP antibiotics for at least 6 hours.

4. Whilst organisms and sensitivities are not available, continue antibiotic treatment.

5. Commence prophylactic antifungal treatment: oral Nystatin 500 000 units QID. Continue prophylactic antifungal treatment whilst patient is on antibiotics. For patient on vancomycin, continue prophylactic antifungal treatment for another 7 days after last dose of vancomycin.
4.4 RECOMMENDED ANTIMICROBIAL THERAPY AND MANAGEMENT AFTER ORGANISMS KNOWN

<table>
<thead>
<tr>
<th>Table 1</th>
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<tbody>
<tr>
<td>1. Patients on antibiotic treatment for peritonitis should be assessed for clinical improvement and have a repeat PD fluid MCS and cell count at days 3 and 5</td>
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<tr>
<td>2. Re-evaluate treatment course after 5 days on appropriate IP antibiotics and repeat PD fluid MCS</td>
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<tr>
<td>3. Repeat PD fluid MCS, cell count and cell differential 7 days after completion of appropriate antibiotic therapy</td>
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<td>4. Refer patient for urgent renal dietitian review as patients with ongoing peritonitis has a tendency to lose more protein during PD</td>
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<td>5. Immediate PD catheter removal is recommended for:</td>
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<td>- Refractory peritonitis - patients with unresolved signs and symptoms of peritonitis (i.e. persisting cloudy effluent and elevated WCC &gt; 100/μL) after 5 days on appropriate antibiotic treatment</td>
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<td>- Peritonitis in conjunction with an exit site or tunnel infection of same organism</td>
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<td>- Patients with intra-abdominal pathology/abscess</td>
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<td>- Peritonitis with multiple enteric or anaerobic organisms</td>
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<td>- Fungal peritonitis</td>
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<tr>
<td>- Relapse peritonitis</td>
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<tr>
<td>- Refractory PD catheter exit-site and tunnel infection</td>
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<tr>
<td>6. Consider PD catheter removal for:</td>
</tr>
<tr>
<td>- Repeat peritonitis</td>
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<tr>
<td>- Mycobacterial peritonitis</td>
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<tr>
<td>- Multiple enteric organisms</td>
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<tr>
<td>7. Reinsertion of PD catheter may be considered 2 weeks after peritonitis treatment completion and resolution of infective symptoms (including fungal peritonitis)</td>
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<tr>
<td>8. Continue antifungal prophylaxis with nystatin (500 000 units orally QID) for the duration of antibiotic treatment. For patients on vancomycin, continue oral antifungal prophylaxis for another 7 days after last dose of vancomycin</td>
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<tr>
<td>9. Administration of oral quinolones (i.e. Ciprofloxacin) should be separated from sevelamer, calcium, oral iron, zinc preparations, sucralfate, magnesium-aluminium antacids, or milk by 2 hours to prevent chelation interactions reducing quinolone absorption (administer quinolone first)</td>
</tr>
<tr>
<td>10. Root cause analysis for every peritonitis episode should be conducted which may include reassessment and retraining of patient/carer’s PD technique by the PD nurses</td>
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</table>
4.4.1 Staphylococcus aureus
Change to IP cefazolin 250mg in each CAPD bag for 4 × CAPD exchanges a day as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Cefazolin (250 mg)

OR

Change to another IP or IV antibiotic based on sensitivities
a) Review PDC exit site again and swab for MCS if necessary
b) For Staphylococcus aureus peritonitis, collect body swabs (i.e. nasal, groin, axilla and umbilicus) to determine if the patient is a carrier of this organism.
   - For nasal carrier, patient must commence on nasal mupirocin treatment immediately as per SGH CLIN Peritoneal Dialysis (PD) – Nasal Swab And Mupirocin. Please refer to therapeutic guidelines for full decontamination protocol which includes chlorhexidine 2% or triclosan 1% washes for 5-7 days.
c) Refer to Table 1 and Treatment Flowchart 1 (Appendix 1) for subsequent management
d) If clinical signs and symptoms of peritonitis are resolving, continue antibiotic therapy for a total duration of 21 days on appropriate antibiotics

4.4.2 Methicillin Resistant Staphylococcus Aureus (MRSA) or Methicillin Resistant Staphylococcus Epidermidis (MRSE) Peritonitis (including Non-resolving Gram Positive Organism Peritonitis), Coagulase-Negative Staphylococcus, Staphylococcus epidermidis and other Gram Positive Organisms (including multiple gram positive organisms)

Note: for Coagulase-Negative Staphylococcus – a total of 14 days of appropriate antibiotic treatment
a) Stop IP Gentamicin
b) Continue with or start IP vancomycin 30mg/kg (up to a maximum of 2g) at least weekly for 21 days
   - Check trough vancomycin level on day 5-7
   - Patient should receive another dose if trough serum levels is <15mg/mL
   - Timing of repeated dosing should be based on trough serum level and is likely to be every 5-7 days. Levels are not required if dosing is weekly.
c) Add rifampicin 450-600mg/day and fucidic acid 500mg/twice daily orally for 7 days as adjunctive treatment for MRSA peritonitis
d) Collect body swabs (i.e. nasal, groin, axilla and umbilicus) to determine if patient is a MRSA carrier. If MRSA +ve consider decolonisation as per therapeutic guidelines as outlined above.
e) Refer to Table 1 and Flowchart 1 (Appendix 1) for subsequent management
f) If clinical signs and symptoms of peritonitis are resolving, continue antibiotic therapy for a total duration of 21 days on appropriate antibiotics

4.4.3 Streptococcus Peritonitis
a) Commence preferred IP antibiotic treatment of ampicillin 250 mg in each CAPD bag for 4 x CAPD exchanges a day as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Ampicillin Administration (250 mg)
b) Refer to Table 1 and Treatment Flowchart 1(Appendix 1) for subsequent management
c) If clinical signs and symptoms of peritonitis are resolving, continue IP antibiotic therapy for a total duration of 14 days on appropriate antibiotics

4.4.4 Enterococcus Peritonitis susceptible to ampicillin
Ampicillin 250mg in each CAPD bag for 4× CAPD exchanges a day as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Amoxicillin Administration (250mg)

4.4.5 Enterococcus resistant to ampicillin
a) Continue with or start IP Vancomycin 30mg/kg (up to a maximum of 2g) at least weekly for 21 days.
   - Check trough Vancomycin level on day 5
   - Patient should receive another dose if trough serum level is <15mg/mL
   - Timing of repeated dosing should be based on trough serum level and is likely to be every 5-7 days. Levels are not required if dosing is weekly.
b) For severe peritonitis, add IP Gentamicin 40mg in a PD fluid bag daily for 21 days as adjunctive treatment
c) For Vancomycin resistant Enterococcus (VRE) please contact infectious diseases/Microbiology for appropriate agent
d) Refer to Table 1 and Treatment Flowchart 1 (Appendix 1) for subsequent management
e) If clinical signs and symptoms of peritonitis are resolving, continue antibiotic therapy for a total duration of 21 days on appropriate antibiotics

4.4.6 Corynebacterium Peritonitis
a) Treat with IP antibiotic base on sensitivity for 21 days
b) Refer to Table 1 for subsequent management
c) For relapsing Corynebacterium peritonitis, continue with or start IP Vancomycin 30mg/kg (up to a maximum of 2g) at least weekly for 21 days
   - Check trough Vancomycin level on day 5
   - Patient should receive another dose if trough serum levels is <15mg/mL
   - Timing of repeated dosing should be based on trough serum level and is likely to be every 5-7 days. Levels are not required if dosing is weekly.

4.4.7 Other Gram Negative Organisms (including Citrobacter, Enterobacter, E.Coli, Klebsiella, Proteus, Providentia, Serratia etc)
a) Adjust or change IP antibiotic treatment based on susceptibilities and/or discuss with ID/Microbiology.
b) If cefepime is indicated, continue with IP Cefepime 1g daily
   Or
c) If ceftazidine is indicated:
   - Commence IP Ceftazidine 1g loading dose as SGH CLIN Peritoneal Dialysis – Intraperitoneal Ceftazidine (1g) and
   - Continue with maintenance dose of IP Ceftazidine 250mg in each CAPD bag for 4 x CAPD exchanges a day as per SGH CLIN Peritoneal Dialysis – Intraperitoneal Ceftazidine (250mg)
d) Refer to Table 1 and Treatment Flowchart 2 (Appendix 2) for subsequent management

e) If clinical signs and symptoms of peritonitis are resolving, continue antibiotic therapy for a total duration of 21 days on appropriate antibiotics.

4.4.8 Stenotrophomonas Peritonitis

a) Switch to oral trimethoprim/sulfamethoxazole

b) Refer to Table 1 and Treatment Flowchart 2 (Appendix 2) for subsequent management

c) If clinical signs and symptoms of peritonitis are resolving, continue dual antibiotic therapy for a total duration of 21 – 28 days on appropriate antibiotics

4.4.9 Pseudomonas Peritonitis without PD catheter exit site or tunnel infection

a) Continue with IP Cefepime 1 g daily and add oral Ciprofloxacin 500 mg daily depending on susceptibilities.

b) Refer to Table 1 and Treatment Flowchart 2 (Appendix 2) for subsequent management

c) If clinical signs and symptoms of peritonitis are resolving, continue dual antibiotic therapy for a total duration of 21 days on appropriate antibiotics

4.4.10 Pseudomonas Peritonitis with or following a PD catheter exit site or tunnel infection

a) Arrange for immediate PD catheter removal.

b) Continue with dual treatment of IP Cefepime 1 g daily and oral Ciprofloxacin 500 mg daily whilst PD catheter is in situ and depending on susceptibilities

d) Refer to Table 1 and Treatment Flowchart 2 (Appendix 2) for subsequent management

c) Continue with oral or systemic antibiotics based on sensitivity for 14 days from time of PD catheter removal

4.4.11 Fungal Peritonitis

a) Stop empiric IP antibiotics

b) Arrange for urgent PD catheter removal

c) Commence parenteral echocandins as per CLIN Peritoneal Dialysis

d) Stepdown to IP fluconazole appropriate if organism is susceptible/if PD catheter is still in situ.

e) Continue with the appropriate oral or systemic antifungal treatment based on susceptibilities for 14 days from the time of PD catheter removal. Contact ID / Microbiology for advice on agent to use.

4.4.12 No Growth (Culture Negative) Peritonitis

a) Confirm if patient is on any antibiotic treatment at time of PD fluid collection for MCS. If previous peritonitis episodes are with no growth, the microbiologist should be informed of the details of the patient and further cultures can be obtained

b) Continue with daily IP Cefepime 1 g

c) At day 3, repeat clinical assessment and send PD effluent again for MCS, cell count with differential and fungal cultures
d) If clinical signs and symptoms of peritonitis are resolving, continue IP Cefepime 1g daily for a total duration of 14 days.
e) If clinical signs and symptoms of peritonitis are not improving or not resolving after 5 days, repeat clinical assessment and send PD effluent again for special culture of unusual causes i.e. legionella, mycoplasma, mycobacteria, nocardia, viral and other fastidious bacteria and consider PD catheter removal.

4.4.13 Polymicrobial Peritonitis (Multiple enteric organisms or mixed gram-negative/gram-positive)

a) Continue with or start IP Vancomycin 30mg/kg (up to a maximum of 2g) at least weekly for 21 days
   - Check trough Vancomycin level on day 5
   - Patient should receive another dose if trough serum level is <15mg/mL
   - Timing of repeated dosing should be based on trough serum level and is likely to be every 5-7 days. Levels are not required if dosing is weekly.
b) Add IV or oral Metronidazole as a second antibacterial agent and either gentamicin or cefazolin to cover gram negatives.
c) Refer to Table 1 and Treatment Flowchart 2 (Appendix 2) for subsequent management.
d) If clinical signs and symptoms of peritonitis are resolving, continue dual antibiotic therapy for a total duration of 21 days on appropriate antibiotics.
e) For multiple enteric organisms, likely source is intra-abdominal pathology:
   - Arrange for an abdominal CT scan and surgical assessment.
   - PD catheter removal should be considered. Continue IV antibiotics for 14 days from time of PD catheter removal.

4.4.14 Mycobacterial (M) Peritonitis

a) Treatment for M. Tuberculosis (TB) Peritonitis is to be based on general protocols for TB treatment and as per NSW Health PD2014_050 Principles for the Management of Tuberculosis in New South Wales.
   - Start treatment with four anti-TB agents: Rifampicin, Isoniazid, Pyrazinamide and Ofloxacin.
   - Stop pyrazinamide and ofloxacin after 2 months
   - Continue anti-TB treatment of rifampicin and isoniazid for 12 – 18 months
   - Pyridoxine (50 – 100 mg/day) should be given to avoid isoniazid-induced neurotoxicity.
b) Treatment and duration of treatment for non-TB mycobacteria peritonitis is to be based on sensitivities and in consultation with the Infectious Diseases team.
   - PD catheter removal is necessary.
4.5 RECURRENT, REFRACTORY, RELAPSING AND REPEAT PERITONITIS TREATMENT

1. Arrange for urgent PD catheter removal to preserve the peritoneum
2. Continue with the appropriate oral or systemic antibacterial treatment based on sensitivity for 14 - 21 days from time of PD catheter removal
3. Schedule reinsertion of PD catheter 2 weeks after peritonitis treatment completion & resolution of infective symptoms

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5. Keywords
Peritonitis, Infection, Peritoneal dialysis, Peritonitis management

6. Functional Group
Renal, Peritoneal Dialysis

7. External References

Ballinger, A. P., Suetonia; Wiggins, Kathryn; Craig, Jonathan; Johnson, David; Cross, Nicholas; Strippoli, Giovanni (2014). Treatment for peritoneal dialysis-associated peritonitis. Cochrane Database of Systematic Reviews, 4. doi: 10.1002/14651858.CD005284.pub3


Approved by: SGH & TSH Clinical Governance Documents Committee / Safe Use of Medicines Committee Date: June 2018
Trim No.T18/47494

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SGH CLIN 442 Clinical Business Rule

30(4), 393-423. doi: 10.3747/pdi.2010.00049


Wong PN, Lo KY, Tong GMW et al. (2007). Prevention of fungal peritonitis with nyastatin prophylaxis in patients receiving CAPD. *Perit Dial Int; 27*:531–6

### 8. Consumer Advisory Group (CAG) approval of patient information brochure (or related material)

Not applicable

### 9. Implementation and Evaluation Plan

Including education, training, clinical notes audit, knowledge evaluation audit etc

- Included in the education tools developed to assist nurses in increasing their knowledge to the care of patients on peritoneal dialysis i.e. Renal care flip chart, advance and basic PD learning package and PD orientation package
- Monthly inservice education by PD CNC/nurses to all renal nurses
- PD tutorial to Junior Medical Officers by the PD CNC at the beginning of renal rotation

Approved by: SGH & TSH Clinical Governance Documents Committee / Safe Use of Medicines Committee
Date: June 2018
Trim No.T18/47494

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| **10. Knowledge Evaluation** | **Q1:** What are the initial signs and symptoms of peritonitis?  
A: Peritonitis may present with cloudy peritoneal fluid and/or abdominal pain with or without nausea, vomiting, diarrhoea and fever  
**Q2:** What is the management of patients with suspected peritonitis?  
A: Review patient, collect PD fluid specimen for MCS, cell count & differential, a review of their PDC exit site ± swab for MCS, commence empiric IP antibiotic and prophylactic anti-fungal treatment and admit in 4S renal ward for ongoing management if unwell  
**Q3:** When would empiric antibiotic therapy commence?  
A: Preferably after exit site swab and PD fluid specimen are collected for MCS & cell differential on symptomatic patients.  
**Q4:** What are the indications for PD catheter removal?  
A: Immediate removal for patients with intra-abdominal pathology/abscess or multiple enteric or anaerobic organisms or refractory PD catheter exit-site and tunnel infection. Urgent removal is also indicated for catheter-related, fungal, refractory and relapsing peritonitis |
| **11. Who is Responsible** | Director of St George and Sutherland Renal Service.  
Nursing Unit Manager, Dialysis Unit |
# Approval for Peritonitis Management and Treatment

| *Specialty/Department Committee | Committee title: Peritoneal Dialysis Committee  
|                                | Chairperson name/position: Franziska Pettit, Staff Specialist  
|                                | Date: 08.05.18 |
| *Nursing/Midwifery Co-Director | Name/position: Kim Bonnici, A/Nurse Manager Medicine 1  
|                                | Date: 13.05.18 |
| *Medical Co-Director           | Name/position: George Mangos, Department Head Renal Services  
|                                | Date: 09.05.18 |
| *Drug and Therapeutics Committee (SGH) | Chairperson’s Name: A/Prof Winston Liauw  
|                                | Date: 06.08.18 |
| Contributors to CIBR development | Dr Franziska Pettit, Staff Specialist,  
| E.g. CNC, Medical Officers (names and position title/specialty) | Dr George Mangos, Department Head Renal Services,  
|                                | Suman Adhikari, Pharmacist SES/St George Clinical Services  
|                                | Dr Mark Brown, Medical Director Division of Medicine  
|                                | Dr Sunil Badve, Staff Specialist |

## Revision and Approval History

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<th>Revision number</th>
<th>Author (Position)</th>
<th>Revision due</th>
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<tr>
<td>May 2018</td>
<td>0</td>
<td>Anna Claire Cuesta (PD CNC)</td>
<td>May 2021</td>
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## General Manager’s Ratification

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<thead>
<tr>
<th>Name</th>
<th>Date: 24.07.18</th>
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<tbody>
<tr>
<td>Leisa Rathborne</td>
<td></td>
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</table>
Appendix 1 – Treatment Flowchart 1

**Gram-positive cocci on culture**

- Continue gram-positive coverage based on sensitivities.
  - If enterococci, adjust coverage to vancomycin or other appropriate agents.
  - If methicillin resistant, adjust coverage to vancomycin or other appropriate agents.

Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3-5

- **Clinical improvement:**
  - continue antibiotics;
  - re-evaluate for occult exit-site or tunnel infection

- **No clinical improvement:**
  - re-culture and evaluate

- **No clinical improvement by 5 days on appropriate antibiotics:**
  - remove catheter

- **coagulase-negative staphylococci**
  - treat for 14 days

- **S. aureus**
  - screen for S. aureus carrier;
  - treat for 21 days

- **Enterococci**
  - treat for 21 days

- **other streptococci**
  - treat for 14 days

Peritonitis resolves but persistent exit-site or tunnel infection

- consider simultaneous catheter removal and re-insertion

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Appendix 2 – Treatment Flowchart 2

Gram-negative bacilli or mixed bacterial growth on culture

Continue gram-negative coverage based on sensitivities. Consider switching to 3rd or 4th generation cephalosporine.

Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3-5

Clinical improvement: continue antibiotics

No clinical improvement: re-culture and evaluate

No clinical improvement by 5 days on appropriate antibiotics: remove catheter

*Pseudomonas or Stenotrophomonas species*

give 2 effective antibiotics based on sensitivity*: re-evaluate exit site and tunnel

treat for 21-28 days

other gram-negative bacilli

treat for 21 days

mixed gram-negative or gram-negative + gram-positive organisms

counter surgical problem; in addition to gram-negative coverage, consider metronidazole and ampicillin/vancomycin

treat for 21 days

Peritonitis resolves but persistent exit-site or tunnel infection

consider simultaneous catheter removal and re-insertion
Appendix 3 – Treatment Flowchart 3

**Signs and Symptoms**
Cloudy Peritoneal Fluid, Abdominal Pain & Rebound Tenderness, Nausea & Vomiting, Constipation/Diarrhoea, Fever

**Diagnostic Tests**
Collect PD fluid specimen for MCS, cell count and cell differential as per PD Fluid Specimen Collection via CAPD or APD WPIs before any antibiotic treatment is given (preferred) or note down all the antibiotics patient received prior to PD fluid specimen collection on the pathology request form.

*Note:* PD catheter connection and exit site swab and/or dressing can be performed by (or under the supervision of) an accredited staff only.

Review PDC exit site and swab for MCS as per PDC Exit Site Infection Management CBR

**Notify:**
Renal consultant and team to review patient during office hours or On-call renal consultant/registrar after hours and PD CNC and team X33770 or page 1091

**Empiric Therapy**
- Daily IP cefepime 1g (dwell for 6 hours) until sensitivities are available or 1g IP loading IP cefazolin (dwell for 6 hours)/ cefazolin 250mg in ea. CAPD bag x 4 daily plus daily IP gentamicin 40mg if high risk of staphylococcal infection or unwell

*Patients with History of MRSA-Empiric Therapy*
Vancomycin 2g & gentamicin 40 mg IP (dwell for 6 hours). Continue with daily IP gentamicin 40mg IP until sensitivities available.

Admit patient in 4 South (preferred) for ongoing peritonitis treatment

IP antibiotic treatment to continue based on susceptibilities once organism/s known
Contact Microbiology or Infectious disease department if unusual MDR organism

Repeat PD fluid MCS and cell count at days 3 and 5

**No improvement**
- Re-evaluate treatment and re-culture after 5 days on appropriate IP antibiotics
- If not responding to treatment (Refractory Peritonitis) REMOVE PD CATHETER
- As per 4.4 Recommended antimicrobial therapy and management after organisms known: Rest from PD and Continue appropriate antibiotic treatment (oral or IV) for 14 days
- Reinsert PD catheter 2 weeks after resolution/treatment of symptoms

**Clinical Improvement**
- Continue antibiotic treatment for 14-21 days as per 4.4 Recommended antimicrobial therapy and management after organisms known
- Continue oral antifungal prophylaxis for the duration of antibiotic treatment
  - Or
  - For patients on Vancomycin, continue oral antifungal prophylaxis for another 7 days after last dose of Vancomycin
- Repeat Culture 7 days post antibiotic therapy
- If peritonitis recurs within 4 weeks, refer to 4.5 Recurrent, Refractory, Relapsing and Repeat Peritonitis Treatment

**Contact Microbiology or Infectious disease department if unusual MDR organism**