

# TREATMENT OF PERITONEAL DIALYSIS (PD) RELATED PERITONITIS

## WA HOME DIALYSIS PROGRAM (WAHDIP) GUIDELINES

### General Principles

1. PD related peritonitis is an EMERGENCY – early empiric treatment followed by close review is essential
2. When culture results and sensitivities are known, antimicrobial therapy should be adjusted to narrow-spectrum agents as appropriate
3. Intraperitoneal (IP) administration is superior to intravenous (IV) dosing in treatment of peritonitis
4. Intermittent and continuous dosing are equally efficacious
5. Selection of antimicrobials must be made in light of both patient's and program's history of micro-organisms and susceptibilities
6. Aminoglycosides, cephalosporins and vancomycin can be mixed in the same dialysis bag without loss of bioactivity
7. Some common definitions for peritonitis can be found below:
  - a. **Recurrent** – an episode that occurs within four weeks of completion of therapy of a prior episode but with different organism
  - b. **Relapsing** – an episode that occurs within four weeks of completion of therapy of a prior episode with the same organism or one sterile episode (relapsing episodes should NOT be counted as another peritonitis when calculating peritonitis rates)
  - c. **Repeat** – an episode that occurs more than four weeks after completion of therapy of a prior episode with the same organism
  - d. **Refractory** – failure of the effluent to clear after five days of appropriate antimicrobials
  - e. **Catheter Related Peritonitis** – peritonitis in conjunction with an exit-site or tunnel infection with the same organism or one site sterile

A senior Renal Physician MUST be contacted if there are any questions pertaining to the treatment of PD related peritonitis

### INITIAL EMPIRIC MANAGEMENT OF PD RELATED PERITONITIS

- All PD patients who present with a cloudy PD drain bag require **IMMEDIATE** antimicrobial treatment

1. Send the whole bag of cloudy PD fluid for laboratory testing  
(Gram stain, MC&S, WCC & differential)
2. Commence antimicrobial treatment covering Gram-positive, Gram-negative organisms and yeast

Gram-positive coverage	Gram-negative coverage	Yeast coverage
Intra-peritoneal vancomycin	Intra-peritoneal gentamicin	Oral nystatin
<u>As a single STAT dose</u> 2 grams	<u>As a single STAT dose</u> 40 mg $\leq$ 60kg 80 mg $\geq$ 60 kg	1 tablet/capsule (500,000 units) QID for duration of IP therapy

Both intra-peritoneal antimicrobials to be placed in the same bag and left to dwell for a minimum of 6 hours

1. Monitor patient's clinical condition – clarity of PD fluid, abdominal pain, fluid status
2. Follow up results of microbiological testing
3. Liaise with Renal Physician to determine appropriate subsequent management

Patients receiving more than one dose of gentamicin or vancomycin should have plasma levels monitored for adequacy and non-toxicity.

### SUBSEQUENT MANAGEMENT OF PD RELATED PERITONITIS: DIRECTED BY CULTURE RESULTS

- **Gram-positive isolate or culture negative**

*Continue vancomycin treatment for Gram-positive organisms. Otherwise treat as directed by the results of culture and susceptibilities in consultation with a specialist, if necessary.*

Culture negative

- Stop gentamicin
- Continue IP vancomycin  
Dose: 2 grams  
Frequency: weekly  
Duration: 14 days

*Staphylococcus* species  
*Corynebacterium*  
species

- Stop gentamicin
- Continue IP vancomycin **or** as directed  
Dose: 2 grams  
Frequency: weekly  
Duration: 21 days

*Enterococcus*

- Continue IP vancomycin **or** as directed  
Dose: 2 grams  
Frequency: weekly  
Duration: 21 days
- Continue IP gentamicin 40 mg  
Frequency: each day  
Duration: 7 days

*Streptococcus* species

- Stop IP gentamicin
- Continue IP vancomycin **or** as directed  
Frequency: weekly  
Duration: 14 days

Polymicrobial Gram +ve  
(without ESI/tunnel  
infection)

- Based on susceptibilities  
Frequency: as advised  
Duration: as advised

### SUBSEQUENT MANAGEMENT OF PD RELATED PERITONITIS: DIRECTED BY CULTURE RESULTS

- **Gram-negative isolates**

*Treatment should be directed by the results of culture and susceptibilities in consultation with a specialist, if necessary*

*Pseudomonas aeruginosa*

- Stop IP vancomycin **and** IP gentamicin
- If susceptible, commence oral ciprofloxacin 500 mg **and** IP cefepime **or** IP ceftazidime 1 gram  
Frequency: daily  
Duration: 21 days

Gram-negative organism (*E.coli*, *Proteus* or *Klebsiella*) - single species isolated

- Stop IP vancomycin **and** IP gentamicin
- If susceptible, commence oral ciprofloxacin 500 mg **and** IP cephalosporin **or** IP cefepime **or** IP ceftazidime 1 gram as per susceptibility  
Frequency: daily  
Duration: 14 to 21 days

*Stenotrophomonas*

- Stop IP vancomycin **and** IP gentamicin
- Consult with an Infectious Disease physician/microbiologist in every case

Polymicrobial Gram-negative peritonitis

- Commence IV piperacillin/tazobactam **and** IP amoxicillin
- Continue IP gentamicin as per susceptibility  
Doses: as advised  
Frequency: as advised  
Duration: 14 days

### SUBSEQUENT MANAGEMENT OF PD RELATED PERITONITIS

#### High-risk peritonitis

*Please contact renal physician  
(may warrant PD catheter removal)*

*Staphylococcus aureus*  
(MSSA or MRSA) with  
exit site /tunnel  
infection

- Seriously consider catheter removal in refractory exit site infection (ESI)  
Adjuvant Treatment continue antimicrobials for at least 14 days after catheter removal

*Pseudomonas aeruginosa* with exit site /tunnel infection

- Seriously consider catheter removal in refractory ESI  
Adjuvant Treatment continue antimicrobials for at least 14 days after catheter removal

Fungal peritonitis

- **IMMEDIATE** catheter removal required
- Consult with an Infectious Diseases physician  
Adjuvant Treatment commence antifungal therapy for 10-14 days after catheter removal

Polymicrobial Gram-negative enteric organisms

- Consider enteric source and investigate source of contamination
- Systemic antimicrobial therapy usually required  
Adjuvant Treatment continue antimicrobials for at least 14 days after catheter removal

*Mycobacterial peritonitis*

- Seriously consider catheter removal
- Consult with an Infectious Diseases physician  
Adjuvant Treatment continue antimicrobials for at least 14 days after catheter removal

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## INDICATIONS FOR CATHETER REMOVAL FOR PERITONEAL DIALYSIS-RELATED INFECTIONS

- Refractory peritonitis
- Relapsing peritonitis
- Refractory exit-site and tunnel infection
- Fungal peritonitis
- Catheter removal may also be considered for
  - repeat peritonitis
  - mycobacterial peritonitis
  - multiple enteric organisms

## STABILITY OF ANTIMICROBIALS

The stability of antimicrobials will vary with different PD solutions. Please check the manufacturer's recommendations with regard to antimicrobial stability in PD solutions. It is also important to consider drug compatibility if adding more than one antimicrobial into a PD solution.

## REFERENCES

- Therapeutic Guidelines: Antibiotic Version 14 2010
- ISPD Guidelines, Peritoneal Dialysis-Related Infections Recommendations: 2010 Update
- ISPD Position Statement on Reducing the Risks of Peritoneal Dialysis-Related Infections: 2011
- Kam-Tao P; Szeto C; Piraino B; Bernardini J; Figueiredo A; Gupta A; Johnson D; Kuijper E; Lye W; Salzer W; Schaefer F; Struijk D. ISPD Guidelines/ Recommendations Peritoneal Dialysis-Related Infections Recommendations:2010 Update. *Peritoneal Dialysis International* 2010 30 pp393-423
- Wong P; Lo K; Tong G; Chan S; Lo M; Mak S; Wong A. Prevention of fungal peritonitis with nystatin prophylaxis in patients receiving CAPD. *Peritoneal Dialysis international* 2007 27 pp531-536
- CARI Guidelines: Treatment of peritoneal dialysis-associated fungal peritonitis 2004

## CONSULTATION

Infectious Diseases Physicians can be contacted for consultation on the following numbers:

Fremantle Hospital	(08) 9431 3333
Royal Perth Hospital	(08) 9224 2244
Sir Charles Gairdner Hospital	(08) 9346 3333

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These guidelines were prepared by the **Western Australian Committee for Antimicrobials** of the **Western Australian Therapeutics Advisory Group**

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