This form is to be used to assess patients on peritoneal dialysis who present with any of the following symptoms (tick as appropriate)

- Cloudy effluent
- Abdominal pain
- Febrile
- Systemically unwell

Assessment

- Clinically assess the patient
- If temperature above 38°C collect blood cultures
- Inspect exit site
  - Swab site if signs of infection
- Collect sterile sample of PD fluid
  - Metro: Collect minimum 60 mL of dialysate effluent (10 mL for cell count, 50 mL for gram stain, and culture / sensitivity)
  - Sample to be taken to local laboratory immediately. Request STAT cell count & differential, gram stain, culture / sensitivity
  - Non metro: Culture / sensitivity in anaerobic and aerobic bottles
    - Specimen should arrive within 6 hours to laboratory
    - If unable to process within 6 hours, add 5mL to EDTA collection tube (purple top)
- Commence immediate Empiric Treatment using table below
- Admit/transfer patient if any of the following (tick as appropriate below):
  - Fever
  - Significant Pain
  - Unable to perform own dialysis
- Contact the Paediatric Nephrologist / Peritoneal Dialysis Unit as soon as practical

Dosing regimen for empiric treatment of suspected peritonitis in children on PD

NB. All antibiotics given intraperitoneally

- MRSA negative patients - use cefepime as monotherapy or cefazolin + gentamicin, if cefepime not available.
- Known/suspected MRSA positive patients - use vancomycin + gentamicin for empiric treatment*.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Initial Dosing</th>
<th>Subsequent Dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SINGLE DWELL ONLY</td>
<td>APD</td>
</tr>
<tr>
<td>Cephalosporins</td>
<td>500 mg/L</td>
<td>125 mg/L</td>
</tr>
<tr>
<td>- cefepime</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- cefazolin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin*</td>
<td>0.6 mg/kg (max 50mg)</td>
<td>-</td>
</tr>
<tr>
<td>Vancomycin*</td>
<td>30 mg/kg (max 1.5g)</td>
<td>-</td>
</tr>
</tbody>
</table>

* If ongoing vancomycin or gentamicin treatment required: Vancomycin - check blood level on day 3 and re-dose vancomycin if serum level <15mg/L; Gentamicin - check level daily and redose if serum level <1mg/L.

Nilstat 500,000u (1 tab) three times daily for duration of antibiotic treatment

Signature Log

To be completed by all staff who initial this pathway
Immediate Treatment

0–6 hours
• Start intraperitoneal antibiotics as soon as possible
• Allow to dwell for at least 6 hours
• Ensure gram positive and gram negative coverage
• Continue usual PD regimen

6–8 hours
• Determine and prescribe ongoing antibiotic treatment
• Ensure follow-up arrangements are clear or patient admitted
• Await sensitivity results

Transfer
• If patient remains unwell may need to be transferring to other facility

Empiric Treatment Following Culture Results

☐ If PD Fluid WCC above 100 x 10^6/L of which 50% are polymorphonuclear neutrophils

Diagnosis of Peritonitis is made

Antibiotic Regimen depends on the results of the culture. Follow the links below to locate the correct regimen.

- Staphylococcus aureus
- Enterococcus/Streptococcus
- Other gram positive organisms
- Pseudomonas species
- Single gram-negative
- Polymicrobial peritonitis day 1–3
- Culture negative on day 1 & 2
- If Gram stain shows fungal elements, remove catheter

Plan of Care

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Consider re-training after successful peritonitis treatment

Medical Officer / Nurse Practitioner
Print name: Signature: Date:
Staphylococcus aureus on culture

- Flucloxacinil-sensitive or nMRSA S. aureus
  - Continue gram-positive coverage based on sensitivities
  - Stop gram-negative coverage
  - Assess exit site again

- Methicillin resistant S. aureus (MRSA)
  - Adjust coverage to vancomycin
  - Check blood level on day 3 and re-dose if serum level <15mg/L

- Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3–5
  - PD fluid collection and send for cell count and culture at day 3–5

Clinical improvement
- Continue antibiotics
- Duration of therapy 21 days

No clinical improvement by 5 days on appropriate antibiotics
- Remove catheter
**Enterococcus/Streptococcus on culture**

- Discontinue empiric treatment
- Start continuous ampicillin 125mg/L each bag; consider adding aminoglycoside for enterococcus
- **Note:** Ampicillin and Aminoglycoside cannot be given in the same bag. Omit Ampicillin when Gentamicin is added to one bag each day.

- If ampicillin resistant, start vancomycin
- Check blood level on day 3 and re-dose vancomycin if serum level <15mg/L
- If vancomycin resistant enterococcus (VRE), seek Infectious Disease opinion

Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3–5:
- Symptoms resolved
- Bags clear

**Clinical improvement**
- Continue antibiotics; duration of therapy:
  - 14 days (streptococcus)
  - 21 days (enterococcus)

**No clinical improvement by 5 days on appropriate antibiotics**
- Remove catheter
- Patient to remain on treatment for 14 days after catheter removal
Other gram-positive organisms including coagulase negative staphylococcus on culture

- Continue gram-positive coverage based on sensitivities
- If cefepime used, consider ‘stepping down’ therapy to first generation cephalosporin if sensitive
- Stop gram-negative coverage

Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3–5:
- Symptoms resolved
- Bags clear

Clinical improvement

- Continue antibiotics
- Duration of therapy: 14 days

No clinical improvement by 5 days on appropriate antibiotics

- Remove catheter
- Patient to remain on treatment for 14 days after catheter removal
Pseudomonas species on culture

Without catheter infection (exit-site/tunnel)
- Treat with gentamicin and ceftazidime if sensitive - otherwise seek ID advice
- Check levels daily on redose if serum trough level < 1mg/L.

Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3–5:
- Symptoms resolved
- Bags clear

Clinical improvement
- Continue antibiotics
- Duration of therapy: 21 days

No clinical improvement by 5 days on appropriate antibiotics
- Remove catheter
- Patient to remain on treatment for 21 days after catheter removal

With catheter infection (exit-site/tunnel) current or prior to peritonitis
- Remove catheter
- Patient to remain on treatment for 21 days after catheter removal

Medical Officer / Nurse Practitioner
Print name: __________________________
Signature: __________________________
Date: __________________________
Other single gram-negative organism on culture

**E. coli, Proteus, Klebsiella**

- Adjust antibiotics to sensitivity pattern
- If cefepime used, consider ‘stepping down’ therapy to first generation cephalosporin if sensitive

Assess clinical improvement, repeat dialysis effluent cell count and culture at days 3–5:
- Symptoms resolved
- Bags clear

**Stenotrophomonas**

- Treat with trimethoprim / sulphamethoxazole 4mg/kg of trimethoprim component twice daily orally (max 160mg/dose)

Assess clinical improvement at days 3–5:
- Symptoms resolved
- Bags clear

**Clinical improvement**

- Continue antibiotics
- Duration of therapy 21 days

**No clinical improvement by 5 days on appropriate antibiotics**

- Remove catheter
- Patient to remain on treatment for 14 days after catheter removal

**Clinical improvement**

- Continue antibiotics for 28 days
- No need to change
Polymicrobial peritonitis: days 1–3

Multiple gram-negative organisms or mixed gram negative/gram positive

• Consider GI problem
• Add oral metronidazole
• Discuss ongoing antibiotic management with Infectious Disease Consultant
• Obtain urgent surgical assessment

Multiple gram-positive organisms

• Touch contamination
• Consider catheter infection
• Continue therapy based on sensitivities – duration 21 days

Without exit site or tunnel infection
• Continue antibiotics
• Duration of treatment for a minimum 21 days

With exit site or tunnel infection
• Remove catheter

• In case of laparotomy indicating intra-abdominal pathology/abscess, remove catheter
• Continue antibiotics for 21 days
Culture negative on day 1 and 2

Continue initial therapy

Day 3: Culture still negative
Clinical assessment
Repeat PD Fluid white cell count and differential

Infection resolving, Patient improvement clinically

- Discontinue gentamicin and continue with/change to 1st generation cephalosporin for 14 days

Infection not resolving

- Special culture technique for unusual causes (e.g. mycobacteria, legionella)
- Consider fungi

Now culture positive

- Adjust therapy according to sensitivity patterns
- Duration of therapy based on organism identified

Clinical improvement

- Continue antimicrobial
- Duration of therapy 14 days

Still culture negative

- No clinical improvement after 5 days, surgically remove catheter

- Continue antibiotics for at least 14 days after catheter removal
**Fungi identified on culture or Gram stain**

- Remove catheter immediately

- Commence oral fluconazole - 6 mg/kg/day (maximum: 400mg daily)

- Seek infectious diseases opinion

- Direct antifungal agent according to infectious disease physician advice (see appendix 1 for antifungal options)

- Therapy should be continued for 14 days after removal of catheter
# Antibiotic Dosing Recommendations for the Treatment of Peritonitis

All doses intraperitoneal unless otherwise stated

<table>
<thead>
<tr>
<th></th>
<th>Continuous&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Intermittent&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loading dose</td>
<td>Maintenance dose</td>
</tr>
<tr>
<td><strong>Aminoglycosides (IP)&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Cephalosporins (IP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefazolin</td>
<td>500 mg / L</td>
<td>125 mg / L</td>
</tr>
<tr>
<td>Cefepime</td>
<td>500 mg / L</td>
<td>125 mg / L</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>500 mg / L</td>
<td>250 mg / L</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>500 mg / L</td>
<td>125 mg / L</td>
</tr>
<tr>
<td><strong>Glycopetides (IP)&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>1000 mg / L</td>
<td>25 mg / L</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>400 mg / L</td>
<td>20 mg / L</td>
</tr>
<tr>
<td><strong>Penicillins (IP)&lt;sup&gt;b&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>-</td>
<td>125mg / L</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aztreonam (IP)</td>
<td>1000 mg / L</td>
<td>250 mg / L</td>
</tr>
<tr>
<td>Imipenem-cilastin (IP)</td>
<td>250 mg / L</td>
<td>50 mg / L</td>
</tr>
<tr>
<td><strong>Linezolid (PO)</strong></td>
<td>&lt;5 Years: 10 mg / kg / dose given three times daily</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>5 - 11 Years: 10 mg / kg / dose given twice daily</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>≥ 12 Years: 600 mg / dose, given twice daily</td>
<td>-</td>
</tr>
<tr>
<td>Metronidazole (PO)</td>
<td>10 mg / kg / dose given three times daily</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(maximum: 1.2 g daily)</td>
<td>-</td>
</tr>
<tr>
<td>Rifampicin (PO)</td>
<td>5 - 10 mg / kg / dose given twice daily</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(maximum: 600 mg daily)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Antifungals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluconazole (IP, IV or PO)</td>
<td>6 mg/kg every 24h (maximum: 400mg daily)</td>
<td>-</td>
</tr>
<tr>
<td>Caspofungin (IV only)</td>
<td>70 mg / m&lt;sup&gt;2&lt;/sup&gt; on day 1 (maximum: 70 mg daily)</td>
<td>50 mg / m&lt;sup&gt;2&lt;/sup&gt; daily (maximum: 50 mg daily)</td>
</tr>
</tbody>
</table>

**IP** = intraperitoneal; **IV** = intravenously; **PO** = orally

<sup>a</sup> For continuous therapy, the exchange with the loading dose should dwell for 3 - 6 hours; all subsequent exchanges during the treatment course should contain the maintenance dose. For intermittent therapy, the dose should be applied once daily in the long-dwell, unless otherwise specified.

<sup>b</sup> Aminoglycosides and penicillins should not be mixed in dialysis fluid because of the potential for inactivation.

<sup>c</sup> If ongoing treatment is required, check level daily and redose gentamicin if serum level <1mg/L.

<sup>d</sup> In patients with residual renal function, glycopeptide elimination may be accelerated. If intermittent therapy is used in such a setting, the second dose should be time-based on a blood level obtained 2-4 days after the initial dose. Re-dosing should occur when the blood level is <15 mg / L for vancomycin. Intermittent therapy is not recommended for patients with residual renal function unless serum levels of the drug can be monitored in a timely manner.