### CLINICAL BUSINESS RULE COVER SHEET

**Prince of Wales/Sydney-Sydney Eye Hospitals and Health Services**

<table>
<thead>
<tr>
<th>NAME OF DOCUMENT</th>
<th>Assessment and management of peritoneal dialysis associated peritonitis</th>
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<tbody>
<tr>
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<td>Clinical Business Rule</td>
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<tr>
<td>FUNCTIONAL GROUP/SUBGROUP</td>
<td>Renal Department Specific Policy</td>
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<tr>
<td>AUTHOR</td>
<td>Michaela Kelleher (Renal CNC)</td>
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### KEY TERMS

- Peritonitis
- Automated peritoneal dialysis
- Continuous ambulatory peritoneal dialysis
- Continuous cyclic peritoneal dialysis
- International society of peritoneal dialysis

### SUMMARY

This Clinical Business Rule outlines the diagnosis, initial and ongoing management of patients with peritoneal dialysis associated peritonitis

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**COMPLIANCE WITH THIS DOCUMENT IS MANDATORY**

Feedback about this document can be sent to powhpolicy@sesiahs.health.nsw.gov.au
# Assessment and management of peritoneal dialysis (PD) associated peritonitis

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Assessment and management of peritoneal dialysis (PD) associated peritonitis

1. PURPOSE & SCOPE

The purpose of this policy is to outline the assessment and management of peritonitis in patients on peritoneal dialysis.

It is estimated that between 60 to 90% of episodes of peritonitis resolve with antibiotics. The rates of resolution are higher in the absence of exit site infections.

Peritonitis results in death in 1 to 6% of cases. The cause of death is often cardiovascular and patients with cardiovascular disease appear to be at an increased risk of death from peritonitis. The mortality rate for gram negative and fungal peritonitis is significantly higher (4 to 10% for gram negative; 20 to 45% for fungal). Mortality associated with perforation is approximately 50%.

2. RESPONSIBILITIES

Medical officers
Nursing staff

3. DEFINITIONS

**Peritoneal dialysis (PD):** A treatment option for patients with stage 5 chronic kidney disease which uses the peritoneum as a semipermeable membrane to remove excess toxins and fluid from the patient’s blood.

**Peritoneal dialysis associated peritonitis:** The presence of two clinical signs and symptoms – abdominal pain, nausea, vomiting, diarrhoea, fever, and cloudy dialysate.

**Continuous dosing:** Antibiotics loaded into each bag of peritoneal dialysis fluid

**Intermittent dosing:** Antibiotics given either once daily or dosed based on drug levels

**IP:** Intraperitoneal

**Recurrent/relapsing peritonitis:** Recurrence of peritonitis with the same microorganism (relapse) within 28 days follow up period after cessation of antibiotics

**Refractory peritonitis:** Failure of PD fluid to clear after 5 days of appropriate antibiotic therapy

**Continuous cyclic peritoneal dialysis (CCPD):** PD fluid is left in the abdomen during the day

**Continuous ambulatory peritoneal dialysis (CAPD):** Instillation of dialysis solution by gravity into the peritoneal cavity several times a day and its drainage following a dwell period of variable duration

**Automated peritoneal dialysis:** Refers to all forms of peritoneal dialysis that employ a mechanised device to assist in the delivery and drainage of dialysate

**ISPD:** International Society of Peritoneal Dialysis

**MC&S:** Microscopy, culture and sensitivity testing
Assessment and management of peritoneal dialysis (PD) associated peritonitis

PACS: Post Acute Care Service  
SEALS: South Eastern Area Laboratory Services

4. COMPETENCY/ASSESSMENT  
Peritoneal dialysis is an extended skill and must only be performed by nursing staff who have been assessed as competent

5. CLINICAL BUSINESS RULE  
5.1 Clinical manifestations of PD associated peritonitis  
A diagnosis of peritonitis needs to be excluded in patients on peritoneal dialysis (PD) presenting with any of the following symptoms:  
- Cloudy peritoneal dialysis fluid  
- Abdominal pain/tenderness  
- Fever  
- Chills/rigors  
- Nausea  
- Vomiting  
- Diarrhoea

5.2 Diagnostic criteria (1,2)  
- Cloudy fluid  
- Dialysate white blood cell count > 100/mm³  
- Polymorphonuclear neutrophilic cells > 50%  
- Positive culture  
  - Tuberculous peritonitis may present with a predominance of lymphocytes  
  - Raised peritoneal dialysis eosinophil count may be due to:  
    - Fungal peritonitis (rare)  
    - Reaction to plasticizers in the PD catheter or plastic dialysis bags  
    - Inadvertent entrance of air at the time of the exchange  
    - Use of Icodextrin

5.3 Diagnosis of peritonitis  
Presence of at least two clinical symptoms– abdominal pain, nausea, vomiting, diarrhoea, fever and cloudy PD fluid  
- Peritoneal dialysis white cell count > 100/mm³ with 50% neutrophils  
- Demonstration of bacteria on gram stain

5.4 Initial presentation and management  
Peritoneal dialysis patients presenting with cloudy PD fluid should be presumed to have peritonitis until proven otherwise.
Assessment and management of peritoneal dialysis (PD) associated peritonitis

It is important to initiate empiric antibiotic therapy for PD associated peritonitis as soon as possible as peritonitis has potentially serious consequences (relapse, catheter removal, permanent transfer to haemodialysis, death).

Patients with peritonitis usually present with cloudy PD fluid and abdominal pain; however, peritonitis should always be included in the differential diagnosis of the PD patient with abdominal pain, even if the PD fluid is clear, as a small percentage of patients present this way.

5.4.1 Phone triage by peritoneal dialysis nursing staff (Refer to flow chart Appendix 1)

If the patient contacts the peritoneal dialysis nurse, it is the responsibility of the nurse to assess the severity of the patient’s condition over the phone so that a comprehensive clinical handover can be provided to the ED triage nurse, renal CNC and registrar.

The nurse should ascertain the following information:

- Whether the patient has any of the following symptoms and when the symptoms started:
  - Abdominal pain or tenderness
  - Fever, chills or rigors
  - Nausea, vomiting or diarrhoea
  - Dizziness or lightheadedness

- If the patient has cloudy fluid it should be established when the patient first noticed the fluid was cloudy.
- If abdominal pain is present the patient should be asked to rate their pain on a scale of 1 to 10. Severity of pain will influence triage category.\(^{(3)}\)

<table>
<thead>
<tr>
<th>Table 1. pain score numerical rating scale</th>
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</thead>
<tbody>
<tr>
<td><strong>Descriptive term</strong></td>
</tr>
<tr>
<td>Severe pain</td>
</tr>
<tr>
<td>Moderate pain</td>
</tr>
<tr>
<td>Mild pain</td>
</tr>
<tr>
<td>No pain</td>
</tr>
</tbody>
</table>

5.4.2 Decision Aid

**During working hours: Monday to Friday 0800 – 1630**

If the patient has cloudy fluid and/or mild to moderate abdominal pain, the patient may be assessed in the renal outpatient clinic. The PD nurse should contact and liaise with the Renal CNC.

If the patient has severe abdominal pain and/or rigors and/or vomiting and diarrhoea and/or dizziness the patient should be advised to present to the Emergency department.
CLINICAL BUSINESS RULE

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Assessment and management of peritoneal dialysis (PD) associated peritonitis

5.4.3 Referral to the Emergency department

The PD nurse MUST contact the Emergency department triage nurse to advise them that the patient will be presenting with suspected peritoneal dialysis associated peritonitis. If this occurs during working hours the PD nurse should also notify the Renal CNC and registrar that they have advised the patient to present to ED.

If this occurs after hours, the PD nurse should notify the renal registrar on-call and the nurse in charge on Parkes 9W Renal Ward (P9W).

5.4.4 Presentation at Emergency department (refer to flow chart Appendix 3)

If patients on peritoneal dialysis present to the emergency department with any symptoms suggestive of peritonitis the renal team should be notified as soon as possible following presentation.

During hours: contact the appropriate Renal Registrar and Renal CNC (Page 44355)

After hours: contact the on call renal registrar and P9W (ext 24611).

Treatment of PD associated peritonitis should commence immediately following completion of the appropriate microbiological work up. Treatment needs to be commenced in the absence of diagnostic information.

5.4.5 Clinical documentation

The time, duration, content, advice given and outcome must be clearly recorded on the phone triage record sheet (Appendix 2) by the peritoneal dialysis nursing staff.
5.4.6 Microbiological sampling

In patients suspected of having PD associated peritonitis three samples of PD fluid should be collected for white cell count, manual differential, gram stain culture and sensitivity (the collection of the samples must be done by either the Renal CNC or an RN from the renal ward).

Optimal culture technique is:
- 50mL of PD fluid in yellow top specimen jar
- 10mL of PD fluid inoculated into each of the two blood culture bottles.
- 5mL of PD fluid collected into a purple top EDTA tube

The number of cells in the fluid will depend, in part, on the length of the dwell.
If the patient presents with PD fluid still in the abdomen, drain the fluid out using a freeline solo bag.
If the patient has no fluid in the abdomen then a minimum of 1 litre of dialysate should be infused and allowed to dwell for 1 to 2 hours, then drained and examined for turbidity.

UNDER NO CIRCUMSTANCE MUST A SYRINGE BE ATTACHED TO THE END OF THE CATHETER AND FLUID ASPIRATED

PERITONEAL DIALYSIS IS AN EXTENDED SKILL AND MUST ONLY BE PERFORMED BY NURSING STAFF WHO HAVE BEEN ASSESSED AS COMPETENT

5.4.7 Ordering tests in eMR

- Culture and sensitivity:
  - Select culture other specimen (Maximum 4)
  - From “tests required” box select cell count, culture (includes gram stain and M/C&S)
- WCC: From the order screen select body fluid WCC
- Differential count: from the order screen select differential cell count body fluid

5.5 Intraperitoneal antibiotics\(^{(1)}\)

If the PD fluid is clear then the WCC and differential count should be checked prior to initiating therapy.

If the PD fluid is turbid a loading dose of intraperitoneal antibiotics should be commenced immediately, with the first dose administered by renal nursing staff in the Emergency department.

Intraperitoneal administration of antibiotics is superior to intravenous dosing for treating peritonitis. Intermittent and continuous dosing of antibiotics are equally efficacious\(^{(1)}\). In intermittent dosing, the antibiotic containing solution must be allowed to dwell for at least 6 hours to allow adequate absorption of the antibiotic into the systemic circulation.
CLINICAL BUSINESS RULE

Assessment and management of peritoneal dialysis (PD) associated peritonitis

Empiric antibiotics must cover both gram positive and gram negative organisms and can be prescribed for either continuous or intermittent dosing. Intermittent dosing should be used for patients who do not require hospital admission.

Antibiotics should be prescribed on the NIMC at the following dosages:

**Continuous dosing (in each bag)**

**Loading dose**
- Vancomycin 1g/L IP (maximum 2g)
- Gentamicin 8mg/L IP

**Maintenance dosing**
- Vancomycin 25mg/L IP
- Gentamicin 4mg/L IP

**Intermittent dosing (based on drug levels)**
- Vancomycin loading dose 30mg/kg IP
- Check serum vancomycin levels every 3 to 5 days and if serum trough level is <15mg/L give vancomycin 15mg/kg IP (aim to keep serum trough >15mg/L).
- If serum trough level is >15mg/L, the renal registrar should be contacted to determine whether to withhold the dose or reduce the dose.
- Gentamicin 0.6mg/kg/daily IP. Monitor serum trough level every 3 days.

**Adding antibiotics to PD fluid**

Antibiotics should be added using sterile technique:
- Antibiotics should be added to each of the 6 litre bags using individual syringes for each bag and each antibiotic
- Swab the injection port with an alcowipe
- Insert 21fg needle into the injection port and inject antibiotics
- Ensure PD bag is labelled according to Clinical Business Rule: Labelling of Injectable Medicines, Fluids and Lines.

The following combinations can be mixed in the same dialysis solution without loss of bioactivity:
- Vancomycin and gentamicin
- Vancomycin and ceftazidime
- Cefazolin and gentamicin.

Gentamicin CANNOT be added to the same dialysis solution as penicillins because of chemical incompatibility.

Separate syringes must be used when adding antibiotics to a dialysis solution bag. Whilst the antibiotics may be compatible when mixed in dialysis solution, they are not compatible when drawn up in the same syringe.

Vancomycin and gentamicin may be added to Icodextrin.
Assessment and management of peritoneal dialysis (PD) associated peritonitis

5.6 Laboratory tests
Blood should be collected for the following:
- U/E/Cs, CMP, LFTs
- CRP
- FBC
- Blood cultures (if the patient is febrile or presents with a history of rigors)

The patient’s exit site and tunnel should be examined for signs of infection and an exit site swab taken.

5.7 Responsibilities of the nurse in charge of shift on P9W
If a patient presents to the Emergency department after hours with suspected peritonitis it is the responsibility that the nurse in charge of shift on P9W to ensure the following occurs in timely manner:
- A RN from P9W goes to ED to collect the samples of PD fluid (if the patient is on the Fresenius system the extension line will need to be changed)
- If the PD fluid is cloudy, IP antibiotic therapy is prescribed and commenced immediately following collection of PD samples
- The first dose of IP antibiotics is administered in ED
- The bed manager is contacted to organise a bed on P9W
- The transfer of the patient to P9W is expedited
- That APD with antibiotics is commenced on arrival to P9W

5.8 Ongoing management

5.8.1 Peritoneal dialysis prescription
The decision to commence the patient on rapid cycling will depend on the patient’s clinical condition. 24 to 48 hours of cycling is recommended for patients with septic shock or grossly turbid fluid.

If the patient requires rapid cycling the following prescription should be used:
- Total volume 23,500mL
- Fill volume 2 to 2.5L (depends on patient, ask patient or check in RISC)
- Therapy time 24 hours
- Last fill Same as fill volume
- Additives Vancomycin 25mg/L and Gentamicin 4mg/L
- Choice of dialysate will depend on the patient’s fluid status
Assessment and management of peritoneal dialysis (PD) associated peritonitis

Following the initial 24 hours of cycling:
If dialysis fluid is still turbid, cycling should continue for a further 24 hours.

For patients on CCPD:
Normal night time prescription with the difference of last fill should be equivalent to their fill volume; one daytime CAPD exchange should also be attended. This should continue for the duration of the admission.

For patients on CAPD:
Every 4 hours CAPD for 48 to 72 hours and then four times a day CAPD

If the PD fluid is not grossly turbid and there is no evidence of septic shock, the patient may continue on their usual dialysis regime with the following adjustments:

If the patient is on CAPD:
The frequency of exchanges should be increased to every four hours until the fluid is clear and then reduced to four times a day. If the patient normally has icodextrin as their last exchange this should be temporarily ceased until the patient resumes four times a day CAPD.

If the patient is on automated peritoneal dialysis:
The programme should be altered so that the patient ends in a fill cycle. An additional daytime CAPD exchange should be performed as APD can result in antibiotic washout. If the patient normally has icodextrin as their final fill cycle, the Icodextrin should be used as the daytime CAPD exchange and the final fill should be dianeal.

The clarity of the PD fluid should be checked and documented in the healthcare record each shift. If the patient is on APD the clarity of the PD fluid should be checked at the drainage port. To assess the clarity of the PD fluid:

- Wait until the patient is in a drain cycle
- Attach a 20mL syringe to the Y connection line on the drain line
- Unclamp the line
- Kink the drain line going to the bucket
- The syringe will automatically fill with fluid (there is no need to aspirate)
- Clamp line, remove syringe and replace cap
- Examine the clarity of the fluid
- Document in clinical records
Assessment and management of peritoneal dialysis (PD) associated peritonitis

5.8.2 Intraperitoneal heparin
If there is a lot of fibrin in the PD fluid, heparin 500units/L may be added to the dialysis solution to prevent fibrin encasement of the catheter. Intraperitoneal heparin is not systemically absorbed and has not been found to affect systemic coagulation factors.¹⁴

5.8.3 Biochemistry
During the acute phase of peritonitis the patient should have the following bloods checked daily:
- U/E/Cs
- CMP
- CRP
- Albumin
- FBC

During episodes of peritonitis patients are at greater risk of developing hypokalaemia. If the patient is hypokalaemic and unable to tolerate oral replacement then potassium chloride can be added to the dialysis solution but the dose should not exceed 4mmol/L, as doses above this concentration have the potential to cause pain.

5.8.4 Monitoring drug levels
Serum drug levels should be monitored every 3 days.¹¹

Monitoring serum drug levels (vancomycin and gentamicin) should be used to detect toxicity rather than efficacy. IP antibiotics act primarily locally and standard microbiological tests (e.g. Minimum Inhibitory Concentration (MIC)) do not account for factors of PD associated peritonitis.¹¹

Vancomycin
The ISPD guidelines recommend repeat dosing of vancomycin if the serum trough level falls below 15mg/L (see section 5.5 intermittent dosing)¹¹.

The MIC in PD fluid of vancomycin for gram positive organisms is generally less than 4mg/L.⁵ Research has suggested that serum vancomycin levels >12mg/L may be associated with better cure rates.⁶

Gentamicin
Aim for a gentamicin level of less than 2mg/L.
Note: There is no consensus to what constitutes subtherapeutic trough serum gentamicin levels. Most units use a threshold of 2mg/L.⁷
Assessment and management of peritoneal dialysis (PD) associated peritonitis

5.8.5 Monitoring

Vital signs
If the patient is systemically unwell, vital signs (temperature, PR, BP, RR, SpO2) should be monitored and recorded at least every 4 hours.

If the patient is clinically stable, vital signs should be monitored and recorded at least four times a day (the length of time between recording vital signs MUST not exceed 8 hours).

Pain score
A pain score should be documented with each set of vital signs.
While patients with peritonitis often have severe pain, some episodes are associated with mild or even no pain. If pain is present, tenderness is typically generalised and is often associated with rebound. Patients should be prescribed appropriate analgesia according to pain score.

Glycaemic control
Patients prescribed insulin may require adjustments to their insulin regime particularly if they require rapid cycling or were previously on Icodextrin which has been temporarily stopped.

Patients on 24 hours of automated peritoneal dialysis should have their blood glucose level (BGL) monitored at least every 4 hours.

Vascular access
The functioning of the access should be assessed and documented once every shift.

Referral to dietitian
All patients who present with a diagnosis of peritonitis should be referred to a dietitian as peritonitis will increase the amount of albumin lost in the PD fluid.

5.8.6 Duration of antibiotic therapy
Once culture results or sensitivities are known antibiotic therapy should be adjusted to appropriate narrow spectrum antibiotics. For the management of specific organisms refer to Appendix 4.
TABLE 2. ISPD recommendations for duration of antibiotic therapy

<table>
<thead>
<tr>
<th>Organism</th>
<th>Peritonitis without exit site infection</th>
<th>Peritonitis with exit site infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram positive organisms, other</td>
<td>14 days</td>
<td>14 to 21 days</td>
</tr>
<tr>
<td>Streptococcus</td>
<td>14 days</td>
<td>21 days</td>
</tr>
<tr>
<td>Enterococcus</td>
<td>21 days</td>
<td>21 days</td>
</tr>
<tr>
<td>Staph Aureus</td>
<td>21 days</td>
<td>21 days</td>
</tr>
<tr>
<td>Culture negative</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Pseudomonas sp</td>
<td>21 days</td>
<td></td>
</tr>
<tr>
<td>Single gram negative organism on culture, other</td>
<td>14 to 21 days</td>
<td></td>
</tr>
<tr>
<td>Stenotrophomonas</td>
<td>21 to 28 days</td>
<td></td>
</tr>
<tr>
<td>Polymicrobial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple gram negative</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Mixed gram negative / gram positive</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Multiple gram positive</td>
<td>21 days</td>
<td>Remove catheter</td>
</tr>
</tbody>
</table>

After initiation of antibiotic treatment, clinical improvement should occur during the first 72 hours. If the PD fluid is still cloudy on day 3, PD fluid should be recultured and fungal cultures should also be requested.

In order to protect the peritoneum for future use, removal of the catheter should be considered in the following circumstances:

- PD fluid is cloudy after 5 days of appropriate antibiotics (refractory peritonitis)\(^1\)
- Enteric organisms associated with intra-abdominal pathology
- Patient condition deteriorates or there has been insufficient improvement of symptoms after 4 days of treatment\(^2\)
- Fungal peritonitis
- Relapsing peritonitis

If the patient does not have a functioning fistula, a permanent catheter or vascular catheter will need to be inserted. It is not recommended to insert temporary vascular access whilst the
Assessment and management of peritoneal dialysis (PD) associated peritonitis

Infected PD catheter is still in situ. **If possible there should be 24 hours between removal of PD catheter and insertion of a central venous access device for haemodialysis**

5.9 Discharge planning

Patients with peritonitis may be discharged from hospital prior to completing the course of antibiotics if they have clinically improved. It is preferable that patients be discharged on intermittent dosing, rather than continuous dosing.

The following intermittent doses of antibiotics should be prescribed depending on sensitivities:

- Vancomycin IP 15 to 30mg/kg (dosing frequency depends on blood levels)
- Gentamicin IP 0.6 mg/kg (dosing frequency depends on blood levels)

The home dialysis training unit (Phone: 93690309) must be notified of the patient’s discharge and plans for follow up. A clear management plan and medication prescription should be faxed to EDC (Fax: 93690310).

The management plan should contain the following information:

- Date treatment commenced
- Organism found in PD fluid
- Length of treatment
- Frequency of dial monitoring (every 3 days)
- Date of follow up in kidney care centre

If therapeutic drug monitoring is required, a blood form must be given to the patient to take to SEALS pathology. Blood collection will not be performed by PACS.

Patients should be advised to contact the home dialysis training unit if the fluid becomes cloudy or their symptoms return.

A renal clinic appointment should be made for the patient one week after completion of antibiotic therapy. At this clinic appointment, the PD fluid should be recultured.

6. **DOCUMENTATION**

- NIMC
- CAPD record sheet
- CCPD record sheet

7. **COMPLIANCE EVALUATION**

- Annual review of culture and sensitivity profile
- Monthly review of peritonitis rates

Auditing of:

- Adequacy of microbiological sampling
- Time to first antibiotics
- Outcomes
CLINICAL BUSINESS RULE

Prince of Wales/Sydney-Sydney Eye Hospitals and Health Services

Assessment and management of peritoneal dialysis (PD) associated peritonitis

8. RELATED POLICIES/PROCEDURES/GUIDELINES/BUSINESS RULES

<table>
<thead>
<tr>
<th>Number</th>
<th>Policy/Procedure/Guideline/Business Rule</th>
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<tbody>
<tr>
<td>1</td>
<td>Departmental Clinical Business Rule: Peritoneal catheter or extension line contamination (currently draft)</td>
</tr>
<tr>
<td>2</td>
<td>Clinical Business Rule: Labelling of injectable, medicines, fluids and lines.</td>
</tr>
<tr>
<td>3</td>
<td>Clinical Business Rule: Medication Management.</td>
</tr>
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9. EXTERNAL REFERENCES

<table>
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<th>Reference</th>
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10. REVISION & APPROVAL HISTORY

<table>
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<tr>
<th>Date</th>
<th>Revision No.</th>
<th>Author and Approval</th>
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<tbody>
<tr>
<td>6/8/2013</td>
<td>1</td>
<td>M Kelleher (Renal CNC)</td>
</tr>
<tr>
<td>29/11/13</td>
<td>2</td>
<td>Chair of Drugs and Therapeutic Committee</td>
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</tbody>
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APPENDIX 1: Phone triage by peritoneal dialysis nursing staff

Patient on Peritoneal Dialysis contacts peritoneal dialysis staff

**During hours (Monday to Friday 0800 – 1630 hrs), if the patient is haemodynamically stable and has no chest pain, patient to be reviewed in PD unit, if not to be sent to ED**

- Contact Renal CNC Pg44355

**After hours (Monday to Friday after 1700 hours, weekends and public holidays) patient to be sent to ED**

- Contact renal registrar on call and renal ward (speak to person in charge of shift)

Patients has signs and symptoms of peritonitis

- **YES**
  - Commence peritonitis protocol

- **NO**
  - Usual Care

**NOTE: All patients on peritoneal dialysis who require admission to a non monitored bed MUST be allocated a bed on P9W**
APPENDIX 2: Phone triage documentation record

NURSE TELEPHONE TRIAGE RECORD

Date of contact: ___/___/___ Time call started: ___/___/___ Time call ended: ___/___/___

Contact by: ____________________________________________________

Patients name: ____________________________________________________________________________

Address: ___________________________________________________________________________________

Postcode: ___________________________ Phone No.: ___________________________

Patients age (yrs) ___ Patients gender: □ Male □ Female Nephrologist: ___________________________________

Reason for contact: (Symptoms, Onset, Treatments, Other Illnesses)

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Advice given: (Remember: you are not making a phone “diagnosis”. Decisions are made on acuity of signs and symptoms)

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Patient response to advice given:

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Outcome:

| Referred to A&E | Yes | No | N/A |
| Ambulance called | Yes | No | N/A |
| Referred to renal clinic | Yes | No | N/A |
| Renal registrar notified | Yes | No | N/A |
| Renal CNC notified | Yes | No | N/A |
| Renal ward Notified | Yes | No | N/A |

Triage Nurse Name: ____________________________________________________________

Triage Nurse Signature: _______________________________________________________

Follow-up call required within 1 hr to ensure patient has arrived or is on route

Additional comments:

________________________________________________________________________________
________________________________________________________________________________
APPENDIX 3: Patients presenting to Emergency department

Peritoneal dialysis patients presenting to ED with any two of the following:
- Abdominal pain
- Nausea and vomiting
- Diarrhoea
- Cloudy peritoneal dialysis fluid

CONTACT

Monday to Friday
Primary care renal registrar
Renal CNC (pg 44355)

After hours & weekends / PH
On-call renal registrar
Renal ward (ext 24611, 24699)

Send specimen of PD fluid
50 mL in yellow top jar
10 mL inoculated into each blood culture bottles
5 mL in an EDTA tube

PD fluid cloudy
Do further PD exchange and allow to dwell for a minimum of two hours and re-culture

PD fluid clear
Commence IP antibiotics (first dose to be given in ED)
Organise bed on P9W
APPENDIX 4: Treatment of Specific organisms (Refer to table 2 for duration of therapy)

1. **Streptococcal and enterococcal peritonitis**

Both organisms generally cause severe pain.

Ampicillin 125 mg/L in each exchange is the preferred antibiotic and mode of treatment. Gentamicin given once daily 20mg/L may be added for synergy for enterococcal peritonitis. Refer to table 2 for duration of therapy.

2. **Culture negative peritonitis**

Culture negative peritonitis should be monitored and recorded, if the rate is > 20% culture methods should be reviewed and improved.

If there is no growth after 3 days, repeat cell count with differential should be obtained. If the repeat cell count indicates that the infection has not resolved, special culture techniques should be used for the isolation of potential unusual causes of peritonitis:

- Lipid dependent yeast
- Mycobacteria
- Legionella
- Slow growing bacteria
- Campylobacter
- Fungi
- Enteroviruses

3. **Pseudomonas Aeruginosa**

Pseudomonas peritonitis is associated with greater frequency of hospitalisations, higher rates of catheter removal and permanent transfer to haemodialysis.

Use of two antipseudomonal antibiotics is associated with better outcomes. Oral ciprofloxacin can be given as one of the antibiotics. Alternative drugs include:

- Ceftazidime
- Cefepime
- Piperacillin/Tazobactam IV

4. **Stenotrophomonas**

Treatment with carbapenems, fluoroquinolones and third or fourth generation cephalosporins usually precedes a stenotrophomonas infection. Therapy is recommended for 3 to 4 weeks if the patient is clinically improving.
Assessment and management of peritoneal dialysis (PD) associated peritonitis

Treatment with two antibiotics is usually recommended. The most effective agents are usually oral trimethoprim/sulfamethoxazole and IP ticarcillin/clavulanate.

5. **Fungal peritonitis**

Prolonged treatment with antifungal agents to determine response and to attempt clearance is not encouraged. Fungal peritonitis is serious and is the leading cause of death in approximately 25% of episodes.

Some evidence suggests that prompt removal of catheter poses a lesser risk of death.

6. **Mycobacteria**

If peritonitis secondary to mycobacterium is suspected, the drained bag of PD fluid should be sent for culture, as a specific diagnosis is made by culturing the sediment, after centrifugation of a large volume of PD fluid.

The treatment protocol for Mycobacterium tuberculosis peritonitis should be based on the protocol for the treatment of tuberculosis.

Removal of PD catheter is still a contentious issue.