

Management of Peritonitis

A quick, practical guide for effective management of peritonitis based on the 2022 ISPD Peritonitis Guideline Updates¹



PD ACADEMY



Clinical Presentation and Diagnosis of Peritonitis¹

Peritonitis is diagnosed when at least two of the following three criteria are present:

1. Clinical features like abdominal pain and/or cloudy dialysis effluent.
2. White cell count $>100/\mu\text{L}$ or $>0.1 \times 10^9/\text{L}$ in the dialysis effluent (after a dwell time of at least 2 hours) with $>50\%$ polymorphonuclear cells.
3. Positive dialysis effluent culture.
 - Peritoneal dialysis (PD) effluent should be tested for cell count, differential leukocyte count, Gram stain, and culture whenever peritonitis is suspected.
 - Peritoneal dialysis patients should be presumed to have peritonitis when cloudy effluent is presented, until proven otherwise.



Key Activities

1. Perform physical exam, including abdominal palpation, degree and location of pain, exit-site, and tunnel assessment.
2. Disconnect the drained bag and send the sample* to the laboratory for cell count in addition to differential, Gram staining, and culture. Dwell time should be at least 2 hours.¹
3. Inoculate two blood culture bottles (aerobic and anaerobic) with 5–10 mL of effluent.¹
4. After specimen collection, initiate empiric IP antibiotics as soon as possible, even if only cloudy effluent is present.¹
5. In the presence of cloudy effluent, add heparin 500 U/L to a new bag to prevent occlusion of the catheter by fibrin.¹
6. Initiate adequate pain management intervention such as analgesics.¹
7. Assess the need for hospitalization.
8. Review the following with the patient:
 - Possibility of a break-in technique, compliance to hand hygiene, and mask use.
 - Recent procedures, constipation, diarrhea, and antibiotic use.
 - Peritonitis and exit-site infection history and treatment.
 - Use of exit-site prophylaxis.
9. Schedule for follow up and retraining where applicable.

*First cloudy bag or an aliquot thereof.

IP: Intraperitoneal; ISPD, International Society for Peritoneal Dialysis.

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Initial Peritonitis Management

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ISPD Guidelines



Clinical evaluation.
Examine exit site and lumen, catheter tunnel.
Collect PD fluid for cell count, differential count, Gram stain, and culture.

Start IP antibiotics as soon as possible
Allow to dwell for at least 6 hours
Empirical Gram-positive and Gram-negative coverage,
based on patient history and center sensitivity patterns

Gram-positive coverage:
First-generation
cephalosporin or
vancomycin

Gram-negative coverage:
Third-generation
cephalosporin or
aminoglycoside

Monotherapy with
fourth-generation
cephalosporin

Consider adjuvant treatment: Pain control; IP heparin
Recommend anti-fungal prophylaxis
Admit if fever, septic, significant pain, or unable to perform PD at home
Education and assess IP injection technique
Ensure follow-up arrangements

Subsequent management of peritonitis include continued assessment and modification of therapy based on culture and sensitivity results; refer to subsequent sections for specific organisms cultured.¹ Exchange that contains antibiotics must be a minimum 6-hour dwell.¹ Prophylactic antibiotics are suggested after wet contamination of the PD system in order to prevent peritonitis.¹

For more information on the use of antibiotics and subsequent management of peritonitis, refer to the 2022 ISPD guidelines.¹

PD: Peritoneal dialysis; ISPD: International Society for Peritoneal Dialysis.



Patient Education



Abdominal pain



Cloudy effluent

- Instruct the patient to report immediately to the PD unit if there is cloudy effluent, abdominal pain, and fever.²
 - Instruct the patient to collect drained cloudy dialysate and bring it to the clinic.²
 - Make sure to obtain specimens before the initiation of antibiotics.
 - Stress on 100% antibiotic compliance by patients.
 - Instruct the patient to report persistent cloudiness to the PD unit.²



- Teach aseptic technique with emphasis on hand hygiene.³
- Emphasize on routine exit-site care as per hospital protocol to prevent exit-site infection.⁴
- Teach contamination recognition and proper response with focus on:³
 - Breaks in PD system
 - Touch contamination.
- Teach patients to report constipation and diarrhea immediately.⁵
- Teach patients to report pending dental work, colonoscopies, or other invasive procedures to implement antibiotic prophylaxis.⁶



Indications for Peritoneal Catheter Removal¹

Refractory peritonitis*

Failure of the PD effluent to clear after 5 days of appropriate antibiotics or earlier if patients' clinical condition is deteriorating.

Relapsing, recurrent and repeat peritonitis.**

Fungal peritonitis.

Peritonitis with concomitant exit site and tunnel infection, e.g.: *Staphylococcus aureus*, *Pseudomonas*, *Corynebacterium*.

Non-tuberculous mycobacterial peritonitis (in combination with effective antibiotic treatment).

*Observation for antibiotic effect longer than 5 days is appropriate if PD effluent white cell count is decreasing towards normal, instead of mandatory PD catheter removal if effluent does not clear up by day 5.¹

**Simultaneous PD catheter removal and re-insertion be considered after culture of the PD effluent has become negative and the PD effluent white cell count is below 100/μL, in the absence of concomitant exit site or tunnel infection.¹ For more information on indications of catheter removal, refer to the 2022 ISPD guidelines.¹



Measuring, Monitoring and Reporting Peritonitis¹



- PD-related and organism-specific peritonitis rates
- Antimicrobial susceptibilities of the infecting organisms
- Culture-negative peritonitis (<15% of all peritonitis episodes)
- Peritonitis outcomes
- Mean time to first peritonitis episode
- Percentage of patients free of peritonitis per unit time (>80% per year)
- Pre-PD peritonitis

ISPD guidelines suggest a rate of not more than 0.4 peritonitis episodes per year at risk.¹ Every program should monitor, at least on a yearly basis, the incidence and outcomes of peritonitis.¹

Adapted from: Li PK *et al.* 2022

PD: Peritoneal dialysis; ISPD: International Society for Peritoneal Dialysis.

For Healthcare Professionals Only.

References

1. Li PK, Chow KM, Cho Y, *et al.* ISPD peritonitis guideline recommendations: 2022 update on prevention and treatment. *Perit Dial Int.* 2022;42(2):110-153. 2. Li PK, Szeto CC, Piraino B, *et al.* Peritoneal dialysis-related infections recommendations: 2010 update. *Perit Dial Int.* 2010;30(4):393-423. 3. Bernardini J, Price V, Figueiredo A. ISPD Guidelines/Recommendations: Peritoneal dialysis patient training 2006. *Perit Dial Int.* 2006;26(6):625-632. 4. Szeto CC, Li PK, Johnson DW, *et al.* ISPD Catheter-Related Infection Recommendations: 2017 Update. *Perit Dial Int.* 2017;37(2):141 - 154. 5. Szeto CC, Li PK. Peritoneal dialysis-associated peritonitis. *Clin J Am Soc Nephrol.* 2019;14(7):1100-1105. 6. Piraino B, Bernardini J, Brown E, *et al.* ISPD position statement on reducing the risks of peritoneal dialysis-related infections. *Perit Dial Int.* 2011;31(6):614-630.