

Antibiotic Treatment of Peritonitis

*BC Children's Hospital
Step-by-Step Instructions
for Parents and Allied Health
Professionals*



February 2012



Developed by
C. Prestidge, MD, J. Leechik, BSN,
K. Collin, B.Sc.(Pharm), C. White, MD
and the Division of Nephrology, BCCH.
Support provided by the BCPRA.

ACKNOWLEDGEMENTS

Developed for use within the BC Children's Hospital PD Program, these instructions will benefit and standardize the care effectively for most patients in whom they are applied. It remains the treating physician's responsibility to consider any unique issues that might be pertinent to the current scenario, and to make any adjustments to the application of these guidelines to best treat the individual patient.

This document represents the efforts of many, but would not have been possible without those of Dr. Chanel Prestidge, Jennifer Leechik BSN and Kathleen Collin B.Sc.(Pharm), all of whom put in innumerable hours of work to bring this project to completion.

I also would like to acknowledge the full support of the Division of Nephrology, the BCPRRA for funding this project and Linda Coe Graphic Design for their assistance in the design and production of the materials.

Please note it is our intention to review and update these guidelines every two years and all users should ensure that their copy remains current.

Colin White MD
Director of Dialysis, BC Children's Hospital
February 2012

SECTION ONE

Antibiotic Treatment of Peritonitis

Step-by-Step Instructions for Parents and Allied Health Professionals

Parent Questions and Answers	2
Mixing Instructions for Addition to Dialysis Fluid	
i) Cefazolin	4
ii) Tobramycin	6
iii) Vancomycin	8
iv) Ceftazidime	10

SECTION TWO

Contamination: Policy and Procedure

Contamination	14
Transfer Set Change or Attachment	16
Obtaining Specimen	
Y-Set	18
Cycler <i>Using Effluent Sample Bag</i>	19
CAPD	20
Not on Treatment <i>During the Day</i>	21
Laboratory Directory	22

Antibiotic Treatment of Peritonitis

Important Phone Numbers

My nephrologist _____

My nurse _____

My pharmacist _____

My social worker _____

BC Children's Hospital paging system 604-875-2161

BC Children's Hospital main switchboard 604-875-2345

BC Children's Hospital toll-free 1-888-300-3088

Parent Questions and Answers

What are the signs of peritonitis? You may notice:

- cloudy dialysis fluid
- pain or tenderness in the abdomen
or tummy area
- fever and chills
- vomiting

Why do I need to add antibiotics to my dialysis fluid?

Peritonitis is a serious infection that can occur in people on peritoneal dialysis. If you are concerned about possible symptoms of peritonitis, contact the on-call nephrology doctor at BC Children's immediately. The nephrologist may instruct early treatment of peritonitis at home and will advise if you or your child also need to be assessed by your local doctor. It is important that you have instructions from your nephrologist prior to self-medicating.

What are the side effects of antibiotics used to treat peritonitis?

Adding antibiotics (cefazolin, tobramycin, vancomycin, ceftazidime) to dialysis fluid is usually well tolerated. If you notice any of the following signs, call your doctor immediately:

- skin rash
- itching
- hives
- difficulty breathing
- ringing in the ears
- balance problems
- dizziness (severe)

At Children's Hospital we regard the patient and his/her family as our partners. This document does not contain all the known information about antibiotic reactions. If you have any questions or concerns, please discuss them with your doctor, nurse or pharmacist.



Cefazolin Mixing Instructions for Addition to Dialysis Fluid

What supplies do I need to mix Cefazolin?

- one vial cefazolin 1g
(Brand names: Ancef or Kefzol, for example)
- two alcohol swabs
- one 10 mL syringe, or other convenient size
- one 10 mL Sterile Water for Injection
- one 20 (or 22) gauge needle

What do I do?

“Aseptic technique” means “clean method,” and is used to keep needles, syringe parts (plunger and syringe tip) and other important items very clean. Avoid eating, drinking, and talking when you are performing an aseptic technique. Cefazolin should be mixed with “aseptic” (clean) technique according to the following instructions:

1. Check expiration on the vial. Discard if outdated.
2. Clean your work surface with rubbing alcohol. Wash your hands with soap.
3. Remove the top of the cefazolin vial.
4. Wipe the rubber seal on the cefazolin vial with the alcohol swab for 1 minute.
5. Open a needle package, and with the cap on the needle, place the needle on the syringe. Set it aside.
6. Open the Sterile Water vial and swab the rubber seal for 1 minute. Remove the cap from the needle on the syringe. Using the needle and syringe, measure **9.5 mL of Sterile Water.**

7. Add the **9.5 mL of Sterile Water** to the cefazolin vial, slowly against the side of the vial to prevent foaming. Put the cap back on the needle, for safety and sterility. Set aside the needle and syringe.
8. Carefully swirl or “rock and roll” the cefazolin vial until the powder is completely dissolved. If, after lots of swirling, there is still “powder” that won’t dissolve, don’t use this vial, discard it and start over with a new vial.
9. The strength of the cefazolin in the vial is: **100 mg per milliliter (100 mg/mL)**. Use the alcohol swab again to clean the top. Using the syringe and needle, inject some air into the vial, then pull out the amount of cefazolin you need. The nephrologist will tell you how much you need.

Add _____ mL of cefazolin solution to each
_____ Litre bag of Dialysis fluid

10. Measure and add the cefazolin to the dialysis solution as the nurse has taught you.
11. Carry out procedures of peritoneal dialysis according to directions from your nephrologist.
12. Unopened and sealed cefazolin powder should be stored at room temperature in the box or a closed cupboard to protect it from light. Once you have mixed the cefazolin, it can be stored in the **fridge for a maximum of 72 hours**. Discard any unused Sterile Water because it has no preservatives.
13. If you like, you can mix several vials of cefazolin all at once, and keep them in the fridge for up to 72 hours until needed. **Throw away after 72 hours**.

Tobramycin Mixing Instructions for Addition to Dialysis Fluid

What supplies do I need to mix Tobramycin?

- one vial tobramycin 40 mg/mL vial
(= 80 mg/2 mL vial)
- two alcohol swabs
- one 3 or 5 mL syringe
- one 20 (or 22) gauge needle

What do I do?

“Aseptic technique” means “clean method,” and is used to keep needles, syringe parts (plunger and syringe tip) and other important items very clean. Avoid eating, drinking, and talking when you are performing an aseptic technique. Tobramycin should be mixed with an “aseptic” (clean) technique according to the following instructions:

1. Check expiration on the vial. Discard if outdated.
2. Clean your work surface with rubbing alcohol. Wash your hands with soap.
3. Remove the top of the tobramycin vial.
4. Wipe the rubber seal on the tobramycin vial with the alcohol swab for 1 minute.
5. Open a needle package, and with the cap on the needle, place the needle on the syringe.
6. The strength of the tobramycin in the vial is:
40 mg per milliliter (40 mg/mL).

7. Using the syringe and needle, inject some air into the vial, then pull out the amount of tobramycin you need. The nephrologist will tell you how much you need.

Add ____ mL of tobramycin solution to ____ Litres
of Dialysis fluid

8. Measure and add the tobramycin to the dialysis solution as the nurse has taught you.
9. Carry out procedures of peritoneal dialysis according to directions from your nephrologist.
10. Unopened tobramycin vials should be stored at room temperature in the box or a closed cupboard to protect it from light. Once you have opened the tobramycin, it can be stored in the fridge for a maximum of 72 hours. **Throw away after 72 hours.**

Vancomycin Mixing Instructions for Addition to Dialysis Fluid

What supplies do I need to mix Vancomycin?

- one vial vancomycin 500 mg
- two alcohol swabs
- one 10 mL syringe, or other convenient size
- one 10 mL Sterile Water for Injection
- one 20 (or 22) gauge needle

What do I do?

“Aseptic technique” means “clean method,” and is used to keep needles, syringe parts (plunger and syringe tip) and other important items very clean. Avoid eating, drinking, and talking when you are performing an aseptic technique. Vancomycin should be mixed with an “aseptic” (clean) technique according to the following instructions:

1. Check expiration on the vial. Discard if outdated.
2. Clean your work surface with rubbing alcohol. Wash your hands with soap.
3. Remove the top of the vancomycin vial.
4. Wipe the rubber seal on the vancomycin vial with the alcohol swab for 1 minute.
5. Open a needle package, and with the cap on the needle, place the needle on the syringe. Set it aside.
6. Open the Sterile Water vial and swab the rubber seal for 1 minute. Remove the cap from the needle on the syringe. Using the needle and syringe, measure **5 mL of Sterile Water.**

7. Add the **5 mL of Sterile Water** to the vancomycin vial, slowly against the side of the vial to prevent foaming. Put the cap back on the needle, for safety and sterility. Set aside the needle and syringe.
8. Carefully swirl or “rock and roll” the vancomycin vial until the powder is completely dissolved. If after lots of shaking, there is still “powder” that won’t dissolve, don’t use this vial, discard it and start over with a new vial.
9. The strength of the vancomycin in the vial is: **100 mg per milliliter (100 mg/mL)**. Use the alcohol swab again to clean the top. Using the syringe and needle, inject about some air into the vial, then pull out the amount of vancomycin you need. The nephrologist will tell you how much you need.

Add ____ mL of vancomycin solution to ____ Litres
of Dialysis fluid

10. Measure and add the vancomycin to the dialysis solution as the nurse has taught you.
11. Carry out procedures of peritoneal dialysis according to directions from your nephrologist.
12. Unopened and sealed vancomycin powder should be stored at room temperature in the box or a closed cupboard to protect it from light. Once you have mixed the vancomycin, it can be stored in the **fridge for a maximum of 72 hours**. Discard any unused Sterile Water because it has no preservatives.
13. If you like, you can mix several vials of vancomycin all at once, and keep them in the fridge for up to 72 hours until needed. **Throw away after 72 hours**.

Ceftazidime Mixing Instructions for Addition to Dialysis Fluid

What supplies do I need to mix Ceftazidime?

- one vial ceftazidime 1 g
(Brand name: Fortaz, for example)
- two alcohol swabs
- two 10 mL syringe, or other convenient size
- one 10 mL Sterile Water for Injection
- two 20 (or 22) gauge needles

What do I do?

“Aseptic technique” means “clean method,” and is used to keep needles, syringe parts (plunger and syringe tip) and other important items very clean. Avoid eating, drinking, and talking when you are performing an aseptic technique. Ceftazidime should be mixed with an “aseptic” (clean) technique according to the following instructions:

1. Check expiration on the vial. Discard if outdated.
2. Clean your work surface with rubbing alcohol. Wash your hands with soap.
3. Remove the top of the ceftazidime vial.
4. Wipe the rubber seal on the ceftazidime vial with the alcohol swab for 1 minute.
5. Open a needle package, and with the cap on the needle, place the needle on the syringe. Set it aside.
6. Open the second needle package, again with the cap on the needle, place the needle on the syringe. Pull the plunger out of the syringe. Set it aside. This is your venting needle used to release gas formed inside the vial when you mix the solution.

7. Open the Sterile Water vial and swab the rubber seal for 1 minute. Remove the cap from the needle on the syringe. Using the needle and syringe, measure **9 mL of Sterile Water**.
8. Add the **9 mL of Sterile Water** to the ceftazidime vial, slowly against the side of the vial to prevent foaming. Put the cap back on the needle, for safety and sterility. Set aside the needle and syringe.
9. Remove the cap from the venting needle. Insert the venting needle through the rubber seal and leave it there for 2–3 minutes. You may hear the gas being released from the vial.
10. With one hand holding the venting needle in place, and the other hand holding the vial, gently “swirl” or “rock and roll” the vial until the powder is completely dissolved. Be careful, solution may spill out from the venting needle. If after lots of swirling/rock and roll, there is still “powder” that won’t dissolve, don’t use this vial, discard it and start over with a new vial.
11. The strength of the ceftazidime in the vial is **100 mg per milliliter (100 mg/mL)**. Remove the venting needle and put the cap back on for safety. Use the alcohol swab again to clean the top.
12. Using the syringe and needle, add some air into the vial then pull out the amount of ceftazidime you need. The nephrologist will tell you how much you need.

Add ____ mL of ceftazidime solution to each
____ Litre bag of Dialysis fluid

13. Measure and add the ceftazidime to the dialysis solution as the nurse has taught you.
14. Carry out procedures of peritoneal dialysis according to directions from your nephrologist.
15. Unopened and sealed ceftazidime powder should be stored at room temperature in the box or a closed cupboard to protect it from light. Once you have mixed the ceftazidime, it can be stored in the **fridge for a maximum of 48 hours**. Discard any unused Sterile Water because it has no preservatives.
16. If you like, you can mix several vials of ceftazidime all at once, and keep them in the fridge for up to 48 hours until needed. **Throw away after 48 hours.**



**Contamination:
Policy and Procedure**

Contamination: Policy and Procedure

Contamination

Rationale

Contamination can lead to peritonitis. If contamination occurs by accidental disconnection during a PD treatment or if equipment failure (e.g. hole in the solution bag or tubing) occurs with an associated potential contamination, treatment should consist of both a sterile transfer set change and antibiotic prophylaxis as soon as possible to reduce the risk of peritonitis.

Note

Touch contamination before the infusion of dialysate can be treated with a sterile transfer set alone, if the clamp on the transfer set remains closed and no fluid has been infused. There is no need for prophylactic antibiotic usage in this case.

Supplies

- 2 Litre Twin Bag
- red clamp
- minicap
- 70% alcohol and paper towel
- mask
- sterile drape

Procedure

1. Immediately place a clamp on the PD catheter close to the skin. If on dialysis, stop and disconnect.
2. Close the twist clamp on the transfer set and cover with minicap. If the transfer set is disconnected, proceed to *Transfer Set Change or Attachment* on page 16.

3. Obtain an effluent sample for cell count and differential, microscopy and culture (as per *Obtaining Specimen* on page 18).
4. Do three dialysis exchanges (up to a maximum of 500 mL per exchange) without antibiotic and no dwell time (3 quick flushes).
5. For inpatients, proceed to *Transfer Set Change*, see page 16.

6. Antibiotic Therapy

- Give Cefazolin (Ancef) intraperitoneally 20 mg/kg (to maximum dose 2 g).
- Alternative if known colonization with MRSA or allergic – Give 30 mg/kg (maximum 2 g) Vancomycin intraperitoneally.
- Leave to “dwell” for minimum 6 hours and then can continue with dialysis as normal (without antibiotics).
- Subsequent dosing of IP antibiotics to be determined by the dialysate results.

Note

If more convenient, a course of oral Keflex® 50 mg/kg per dose BID x 3 days is also reasonable antibiotic prophylactic therapy as an alternative to IP antibiotics.

Transfer Set Change or Attachment

Supplies

- 70% alcohol and paper towel
- chlorhexidine 2% solution
- gauze 4x4 (3)
- transfer set
- minicap
- sterile drape
- red clamp
- mask
- sterile gloves
- sterile dressing tray

Procedure

1. **Gather** supplies.
2. **Identify** the patient and **Explain** the procedure.
3. **Close** curtains around bed or door to room.
4. **Clamp** the catheter close to the patient using a red clamp.
5. **Clean** the working surface using 70% alcohol and a paper towel.
6. **Prepare** supplies using aseptic technique.
7. **Pour** chlorhexidine 2% solution onto gauze in sterile dressing tray.
8. **Mask** and **Perform Hand Hygiene**.
9. **Don** sterile gloves.
10. **Apply** sterile drape over patient and **Expose** the catheter.

For Transfer Set Change

- i) **Disconnect** the old transfer set and **Discard**.
- ii) Proceed to Transfer Set Attachment.

For Transfer Set Attachment

- i) **Wrap** first chlorhexidine soaked gauze around the exposed adapter of the catheter, **Scrub** for 1 minute, and **Hold** in place.
- ii) **Clean** with second chlorhexidine soaked gauze from the exposed adapter of the catheter towards the patient up to the red clamp, and **Discard**.

Remove the blue protective cap from the new transfer set.

Tightly **Connect** the new transfer set to the catheter via the titanium adapter.

Close clamp on the new transfer set.

Open Minicap package.

Attach the Minicap to the transfer set.

Remove the red clamp from the catheter.

*Proceed in obtaining an effluent sample for cell count and differential, microscopy and culture if it has not yet been done (as per *Obtaining Specimen* on page 17).

After the new transfer set has been applied, **Follow** the antibiotic therapy in *Contamination: Policy and Procedure*.

Obtaining Specimen

Y-Set

Supplies

- 2 C&S containers
- chlorhexidine swab
- mask

Procedure

1. **Mask** and **Perform Hand Hygiene**.
2. **Obtain** specimens during a drain cycle.
3. Carefully **Remove** spike from the drainage bag.
4. **Clean** the spike with chlorhexidine swab for 1 minute.
5. **Open** drainage roller clamp and **Collect** 60 cc of dialysate into the C&S container.
6. **Close** roller clamp.
7. Carefully **Re-insert** the drainage spike into the drainage bag.
8. **Open** roller clamp and continue with drain cycle.
9. **Pour** 10 cc of dialysate into a second C&S container for cell count and differential. The remaining 50 cc should be sent for C&S and gram stain. Specifically request “Please report sensitivity to vancomycin, cefazolin, ceftazidime and tobramycin.”

Label containers and **Send** to lab.

If peritonitis is suspected, send to lab **STAT**.

Cycler Using Effluent Sample Bag

Supplies

- 2 C&S containers
- effluent sample bag
- mask

Procedure

1. **Mask** and **Perform Hand Hygiene**.
2. **Obtain** specimens during Initial Drain or Drain 1.
3. **Close** the clamp on the sample bag.
4. **Connect** the bag to the short line that forms a “Y” on the drain line (Sample line). **Save** caps in empty sterile sample bag package.
5. **Position** bag below the level of the drain line.
6. After draining for 2 minutes, **Open** clamps.
7. When the bag is full, **Close** both clamps.
8. **Disconnect** the sample bag and re-cap sample line (or cover with sterile gauze).
9. **Collect** 50 cc into a C&S container (for gram stain, C&S), specifically request “Please report sensitivity to vancomycin, cefazolin, ceftazidime and tobramycin” and 10 cc into the second C&S container for cell count and differential.

Label containers and **Send** to lab.

If peritonitis is suspected, send to lab **STAT**.

CAPD

Supplies

- 2 C&S containers
- chlorhexidine swab
- 50 mL syringe
- sterile 20 gauge needle
- mask
- minicap (optional)

Procedure

1. **Mask and Perform Hand Hygiene.**
2. **Perform CAPD** exchange.
3. **Clean** injection port of drain bag with chlorhexidine swab for 1 minute.
4. Using needle and syringe, **Withdraw** 60 mL of dialysate from drain bag.
5. **Instill** 50 cc into one C&S container (for gram stain, C&S), specifically request “Please report sensitivity to vancomycin, cefazolin, ceftazidime and tobramycin” and 10 cc into the second C&S container for cell count and differential.

Label containers and **Send** to lab.

If peritonitis is suspected, send to lab **STAT**.

Not on Treatment (During the day)**Supplies**

- 2 C&S containers
- effluent sample bag
- mask
- minicap (optional)

Procedure

1. **Mask and Perform Hand Hygiene.**
2. **Connect** sample bag to transfer set.
3. **Open** the twist clamp of the transfer set and fill the sample bag with at least 60 cc of dialysate.
4. **Close** the twist clamp of the transfer set and **Clamp** the sample bag.
5. **Open** Minicap package.
6. **Disconnect** sample bag from transfer set.
7. **Attach** the Minicap to the transfer set.
8. **Instill** 50 cc into one C&S container (for gram stain, C&S) specifically request “Please report sensitivity to vancomycin, cefazolin, ceftazidime and tobramycin” and 10 cc into the second C&S container for cell count and differential.

NB. If patient has no fluid to drain, fill patient with their regular fill volume preferably using CAPD, dwell for 2 hours and then obtain sample accordingly.

Label containers and **Send** to lab.

If peritonitis is suspected, send to lab **STAT**.

Laboratory Directory

Provincial Health Authority (PHSA)

BC Children's Hospital 604-875-2938

Vancouver Coastal Health Authority (VCHA)

Bella Coola Hospital 250-799-5311
Ex 311 or 2058

Powell River General Hospital 604-485-3211 Ex 4306

Richmond Hospital 604-244-5162 Ex 4143

St. Paul's Hospital 604-806-8810

Vancouver General Hospital 1-800-992-8801

Fraser Health Authority (FHA)

Abbotsford Regional Hospital 604-851-4700 Ex 646520

Burnaby General Hospital 604-434-4211 Ex 533422

Chilliwack General Hospital 604-795-4141 Ex 614108

Delta Hospital 604-940-3431

Eagle Ridge Hospital 604-469-3143

Langley General Hospital 604-533-6403

Ridge Meadows Hospital 604-463-1802

Royal Columbian Hospital 604-520-4300

Surrey Memorial Hospital 604-585-5666 Ex 778611

Vancouver Island Health Authority (VIHA)

Campbell River Hospital 1-866-370-8355

Nanaimo Regional Hospital 1-866-370-8355

Royal Jubilee Hospital 1-866-370-8355

Victoria General Hospital 1-866-370-8355

Interior Health Authority (IHA)

Kelowna General Hospital 250-862-4000 Ex 17501

Penticton Regional Hospital 250-492-9019

Vernon Jubilee Hospital 250-558-1342

Northern Health Authority (NHA)

GR Baker Memorial
Hospital (Quesnel) 250-991-7580

Prince Rupert Regional Hospital 250-622-6175

University Hospital of
Northern BC (Prince George) 250-565-2420

Division of Nephrology
BC Children's Hospital
4480 Oak Street
Vancouver, BC V6H 3V4

Tel 604 875 2345
Toll Free in BC 1-888 300 3088

