

# Standing Orders for the Treatment of Outpatient Peritonitis

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## 1. Definition of Peritonitis:

- a. Cloudy effluent.
- b. WBC > 100 cells/mm<sup>3</sup> with >50% polymorphonuclear (PMN) cells with minimum 2 hour dwell.
- c. Abdominal pain, tenderness, nausea, diarrhea or vomiting may be present.
- d. Bacteria or other microorganism may be seen on gram stain.  
Absence of organisms does not rule out peritonitis.
- e. Presence of two of the above four is clinically indicative of peritonitis.

## 2. Nurse will instruct patient to:

- a. Save the cloudy bag (refrigerated or on ice if delayed).
- b. Record temperature, note any other symptoms.
- c. Notify NKC Peritoneal staff for further instructions.
- d. Patient may be directed to come into unit or go to ER.

## 3. Lab Sampling and Requisitions

- a. Cell Count and Differential (ICD10 = K65.9)
  - i. Send 3 ml lavender topped tube filled with effluent.
- b. Bacterial Culture and Sensitivity with Gram Stain (ICD10 = K65.9)
  - i. Send 10 ml of cloudy effluent into each bottle of a set of two Bactec Culture Bottles (1 aerobic & 1 anaerobic).
  - ii. Send 10 ml sterile yellow-topped tube filled with effluent.
- c. Fungal Culture (ICD10 = K65.9)  
Send 10 ml sterile yellow-topped tube filled with effluent.

## 4. Antibiotic Therapy

- a. **Antibiotics should have a minimum dwell time of six hours.**
- b. CAPD patients will add the antibiotics to the overnight exchange.
- c. APD patients will add the antibiotics to the day exchange. If a day exchange is not usually done, one will be added for the duration of the antibiotic therapy.

## 5. Initial Treatment – Empiric Antibiotics

- a. Determine if patient has emergency kit at home for self-administration of antibiotics.

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- i. If Emergency Kit present, can initiate antibiotics at home with recommended clinic evaluation the same day.
- b. Notify MD.
- c. Check for antibiotic allergies.
- d. Look for evidence of exit site or tunnel infection.
- e. Drug dose may depend on the presence of residual kidney function (RKF).
  - i. If urine output > 100 ml/day = RKF is present.
  - ii. If urine output is  $\leq$  100 ml/day = no RKF.
- f. Antibiotics are administered by the intraperitoneal (IP) route as a single daily dose with the exception of Vancomycin, which is administered every 3-7 days.
- g. Empiric antibiotics will be given until culture results become available.
  - i. **Give combination of Vancomycin and Ceftazidime (Use Tobramycin for cephalosporin allergy)**
    1. Vancomycin is given IP q 3-7 days (based on vancomycin random levels).
      - a. Standard dose: 15-30 mg/kg (See Dosing Chart).
      - b. Vancomycin random level before second and all subsequent doses (target greater than 15 mcg/ml and less than 20 mcg/ml).
      - c. Adjust dose and subsequent dosing interval per specific MD order based on vancomycin random level.

#### AND

2. Ceftazidime 1000 mg IP for weight <50 kg and 1500 mg IP for weight  $\geq$ 50 kg.
3. **For Cephalosporin Allergy Use**
  - a. Tobramycin 0.75 mg/kg/day IP with **RKF present**.
  - b. Tobramycin 0.6 mg/kg/day IP with **no RKF**. (See Dosing Chart)
    - i. Prolonged aminoglycoside use should be avoided if an alternative agent is available. When used, levels should be closely monitored to avoid nephrotoxicity in patients with residual kidney function.
4. If treatment started on a weekend or holiday and patient without emergency kit, discuss with MD levofloxacin for gram negative coverage until NKC pharmacy is available to provide IP medication.
  - a. Levofloxacin dose 500 mg PO first dose then 250mg PO every other day.
5. For vancomycin allergy use Cefazolin.
- h. Refer to Appendix A to adjust antibiotics based on culture and sensitivities. Cefazolin should not be used unless sensitivities known.
- i. Refer to Appendix B tables for antibiotics.

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- j. Consider adding Heparin 500 u/L IP to each bag of dialysate per protocol. (Always use heparin 1:1000 u/ml.)
- k. Fungal prophylaxis recommendation: Oral Nystatin 500,000 units 4 times daily while patients are on antibiotics for greater than 7 days. Recommended to continue 7 days after antibiotic therapy
- l. Notify physician if patient develops diarrhea during antibiotic therapy due to risk of Clostridium Difficile colitis.

#### 6. **Treatment Follow-Up**

- a. Cell count with differential 2 weeks post completion of antibiotics.
- b. If patient is on vancomycin, cell count with differential 19 days post completion of vancomycin.

#### 7. **Retraining and Prevention of Future Infections**

- a. All patients who develop peritonitis must be evaluated in clinic for technique problems and scheduled for retraining and a home visit as needed per nursing evaluation.
- b. Review of aseptic technique and infection-related education topics is mandatory for all patients who develop peritonitis.
- c. Staff should ensure that Gentamicin 0.1% cream is being used to prevent exit site infections in all patients. If patient has a gentamycin allergy Mupirocin cream may be used.
- d. Patients with suspected relapsing\* or recurrent\*\* peritonitis should be evaluated as per peritonitis standing orders.

- ☐ \*Infection with same organism within 30 days of completion of therapy
- ☐ \*\*Infection with different organism within 30 days of completion of therapy

#### 8. **Technique Break (ICD10 = Z41.8)**

- a. To prevent a peritonitis following a break in sterile technique, Cephalixin 500mg PO BID x 3 days is recommended. Alternative treatment is a single dose of Vancomycin 1 gm IP. Each patient must come to PD clinic following a technique break to review aseptic technique and infection-related education topics. Retraining and home visit as needed per nursing evaluation.

#### 9. **References**

- a. ISPD Guidelines/Recommendations: 2016 Update.

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(See referral sheet)

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Patient Name

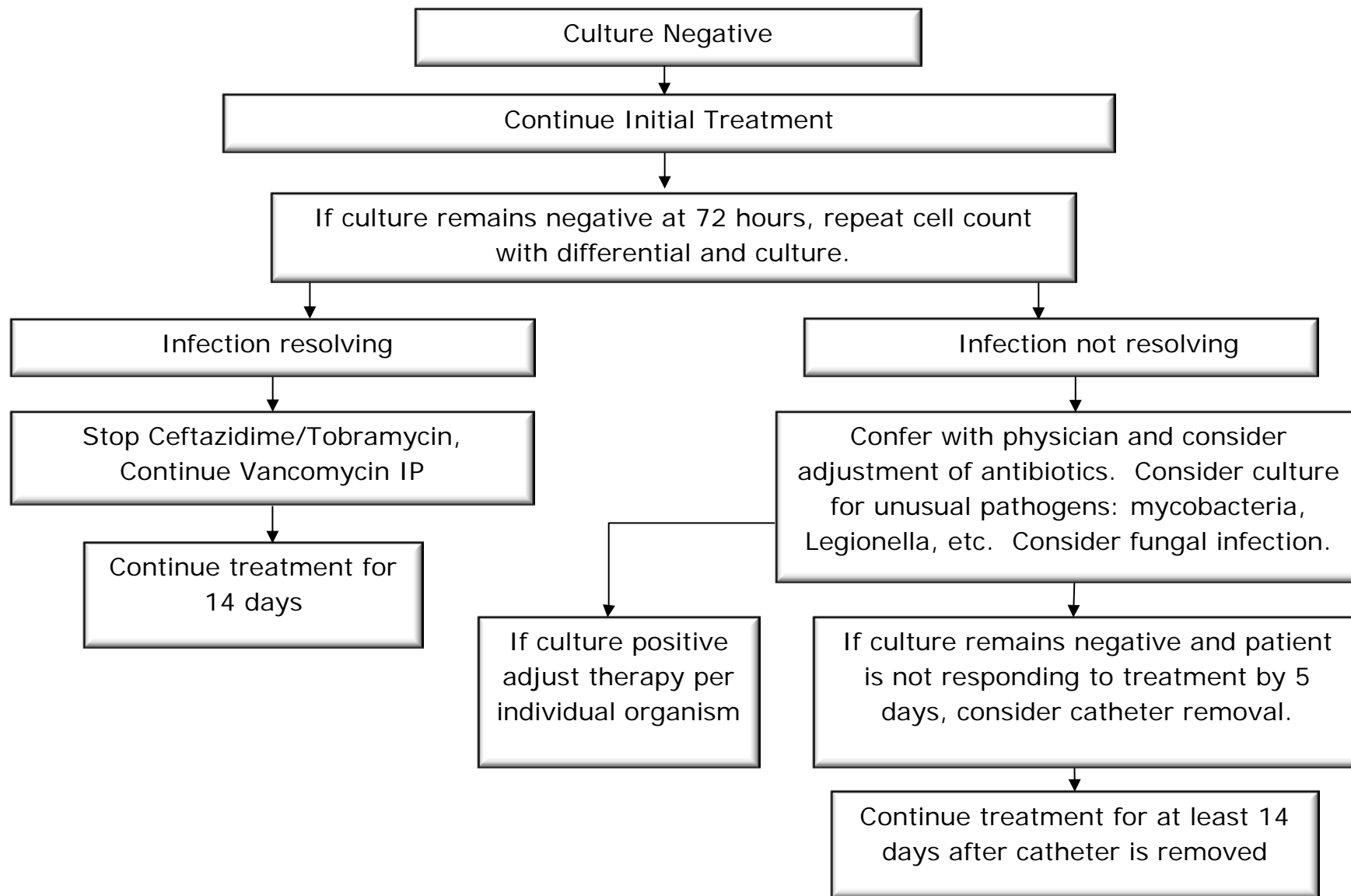
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**APPENDIX A: ANTIBIOTIC ADJUSTMENT ALGORITHMS**

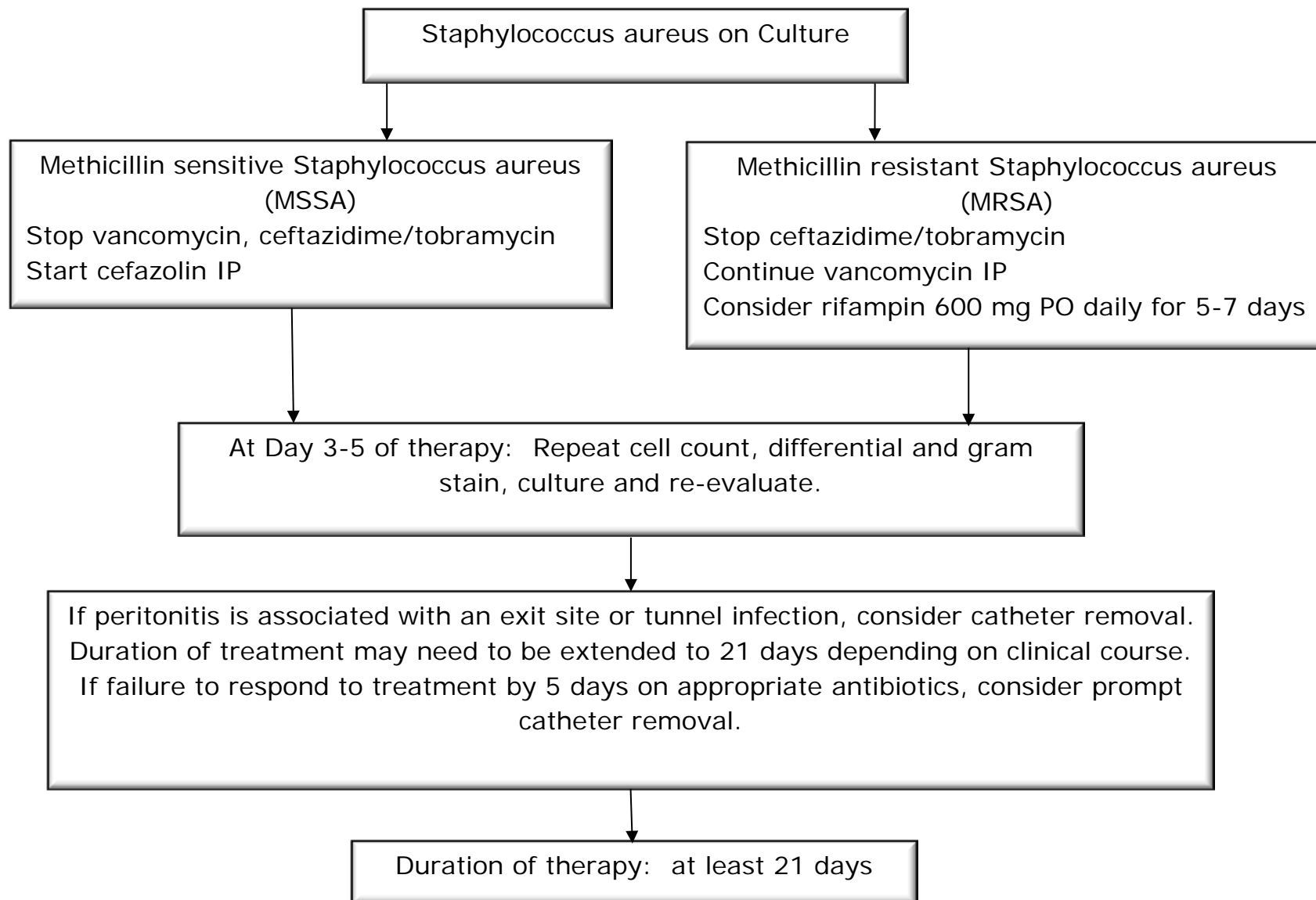
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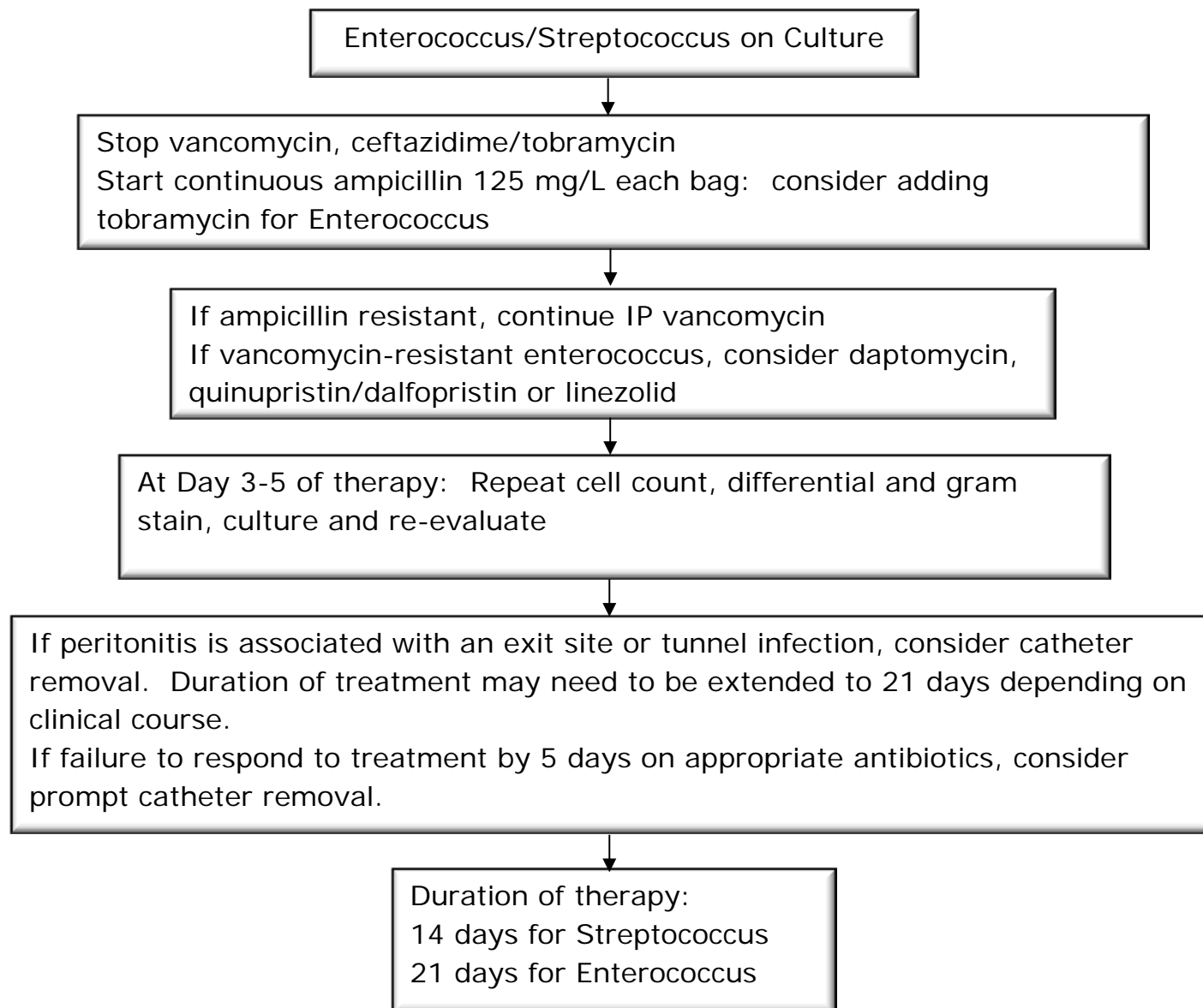
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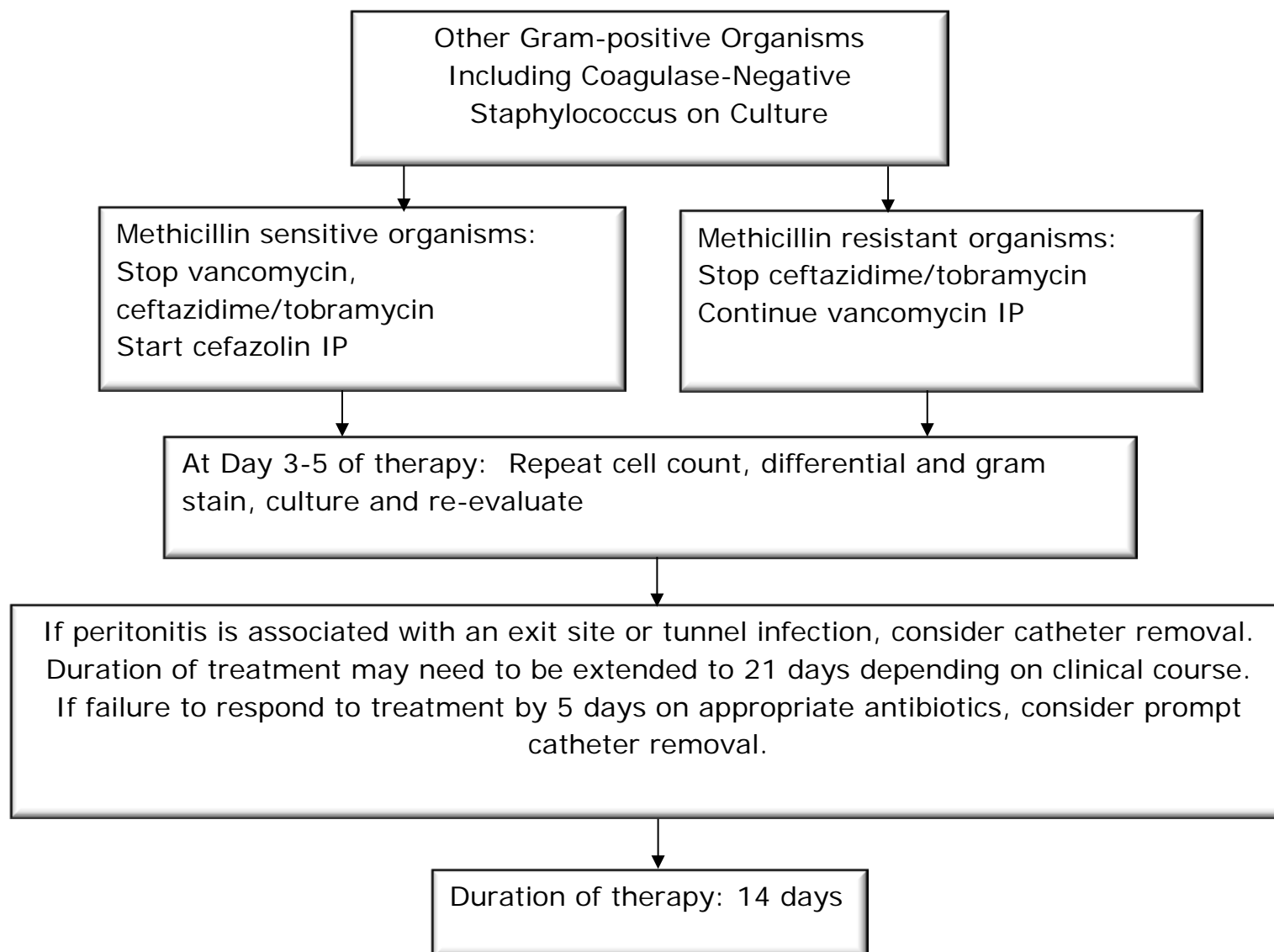
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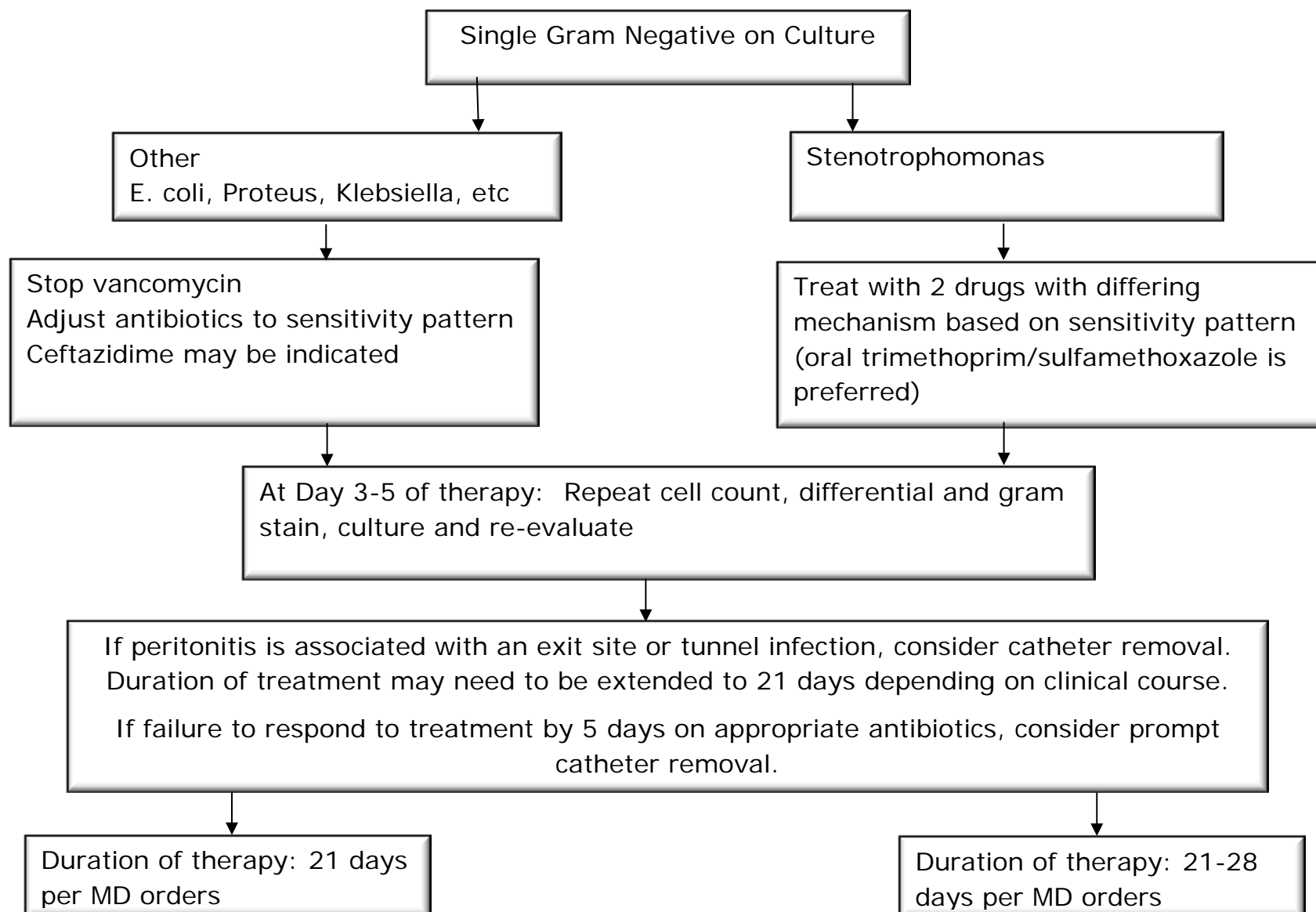
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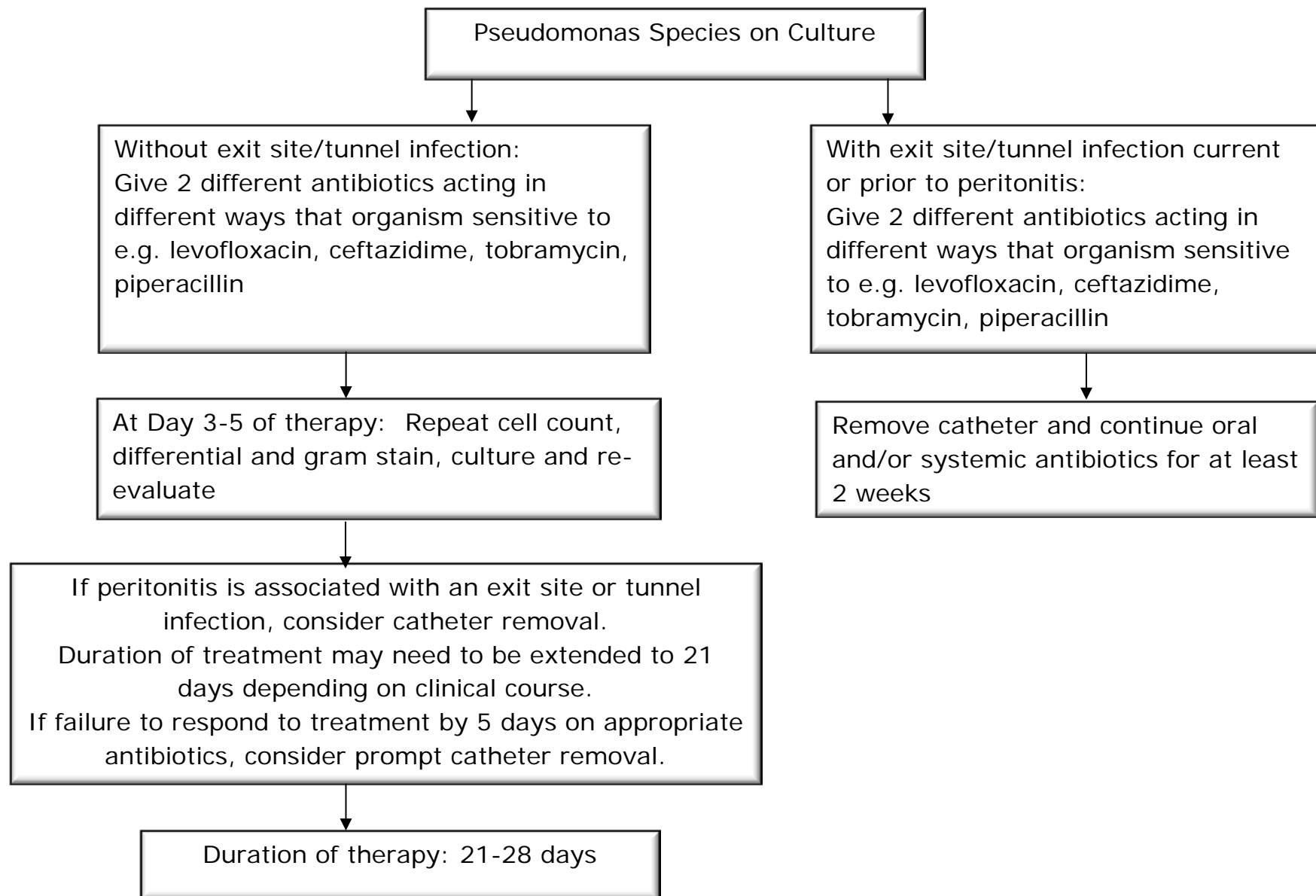
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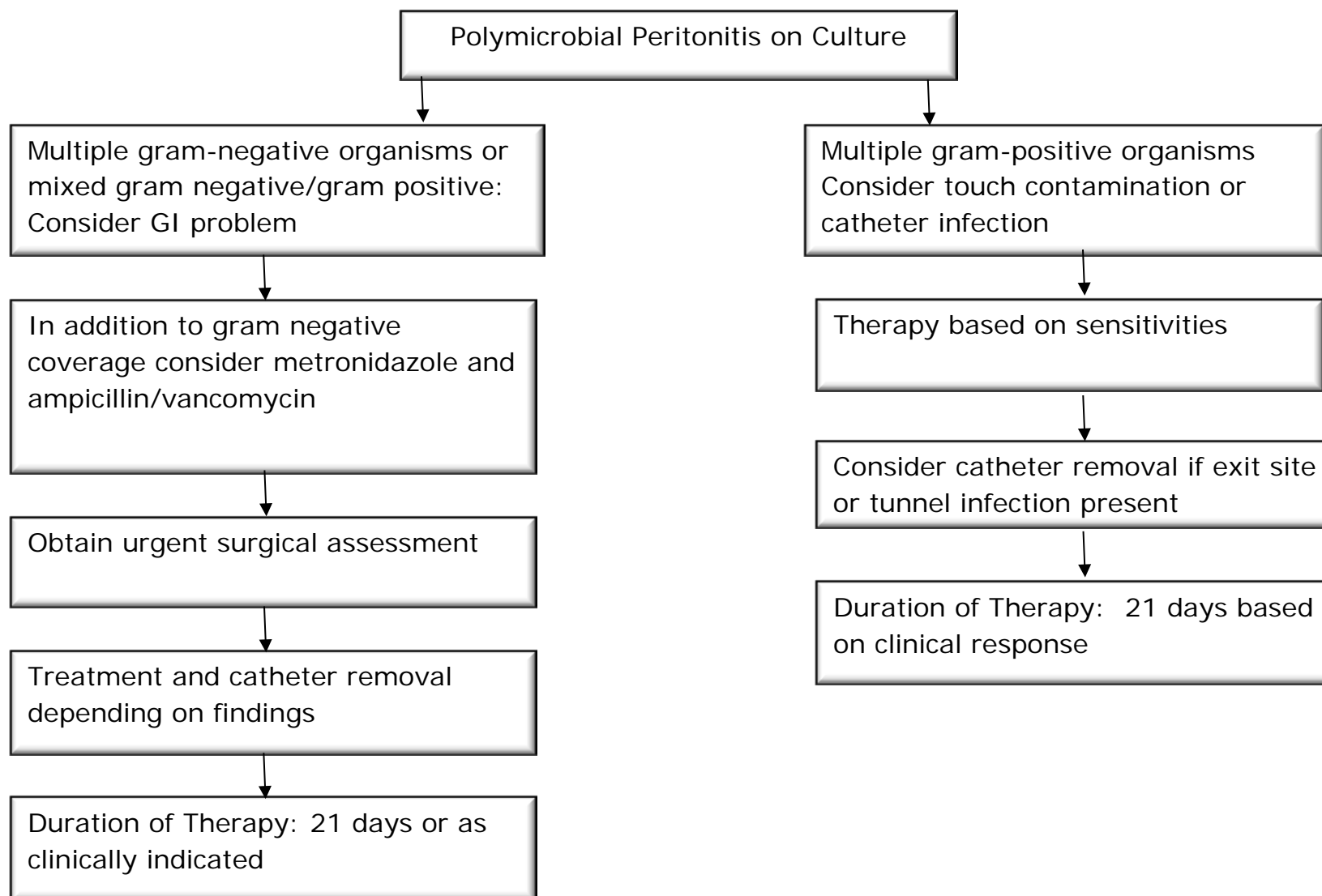




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## APPENDIX B: DOSING ALGORITHM FOR COMMONLY USED IP ANTIBIOTICS

### 1. Vancomycin Dosing (same for RKF present or No RKF)

**IMPORTANT: Vancomycin is dosed every 3-5 days depending on vancomycin trough levels NOT DAILY. Add the entire dose in one bag of the dialysate.**

Actual Weight (Kg)	Vancomycin Dose IP
<60	1000 mg
60-90	1500 mg
>90	2000 mg

- Vancomycin dose and interval will be affected by presence or absence of residual renal function. Shorter dosing intervals should be anticipated with residual renal function while longer dosing intervals should be anticipated in the absence of residual kidney function, guided by trough levels.
- Consult with physician for individual dosing parameters based on trough levels (target greater than 15 mcg/ml and less than 20 mcg/ml).

### 2. Ceftazidime Dosing: 1000 mg IP if < 50 kgs , 1500 mg IP if $\geq$ 50 kgs


### 3. Cefazolin dosing

Cefazolin dose IP	Actual Weight Urine output $\leq$ 100 ml/day Based on 15 mg/kg	Actual Weight Urine output >100 ml/day. Based on 18.75 mg/kg
1000 mg	$\leq$ 66	$\leq$ 53
1500 mg	67-100	54-80
2000 mg	101-133	81-106
2500 mg	>133	>106

### 4. Tobramycin Dosing

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<b>Actual Weight (Kg)</b>	<b>&lt; 100 ml/day urine output: Tobramycin Dose IP Based on 0.6 mg/kg</b>
<b>&lt; 34</b>	<b>20 mg</b>
<b>34-41</b>	<b>25 mg</b>
<b>42-50</b>	<b>30 mg</b>
<b>51-58</b>	<b>35 mg</b>
<b>59-66</b>	<b>40 mg</b>
<b>67-75</b>	<b>45 mg</b>
<b>76-83</b>	<b>50 mg</b>
<b>84-91</b>	<b>55 mg</b>
<b>92-100</b>	<b>60 mg</b>
<b>101-108</b>	<b>65 mg</b>
<b>109-116</b>	<b>70 mg</b>
<b>117-125</b>	<b>75 mg</b>
<b>126-133</b>	<b>80 mg</b>

<b>Actual Weight (Kg)</b>	<b>≥ 100 ml/day urine output: Tobramycin Dose IP Based on 0.75 mg/kg</b>
<b>&lt; 27</b>	<b>20 mg</b>
<b>28-33</b>	<b>25 mg</b>
<b>34-40</b>	<b>30 mg</b>
<b>41-46</b>	<b>35 mg</b>
<b>47-53</b>	<b>40 mg</b>
<b>54-60</b>	<b>45 mg</b>
<b>61-66</b>	<b>50 mg</b>
<b>67-73</b>	<b>55 mg</b>
<b>74-80</b>	<b>60 mg</b>
<b>81-86</b>	<b>65 mg</b>
<b>87-93</b>	<b>70 mg</b>
<b>94-100</b>	<b>75 mg</b>
<b>101-106</b>	<b>80 mg</b>
<b>107-113</b>	<b>85 mg</b>
<b>114-120</b>	<b>90 mg</b>
<b>121-126</b>	<b>95 mg</b>
<b>127-133</b>	<b>100 mg</b>

- Tobramycin dose will be affected by presence or absence of residual renal function.
- Consult with physician for individual dosing parameters based on trough levels (target less than 1mcg/L).