

VASCULAR ACCESS

Diagnosis and Management of Catheter Related Bloodstream Infections



NATIONAL KIDNEY
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Key Concepts for CRSBI

Diagnosis of CRSBI

- Rule out non-catheter causes of CRBSI
- Send 2 sets of cultures (aerobic and anaerobic) from the catheter hub and dialysis circuit BEFORE starting empiric antibiotics

Management: The Patient

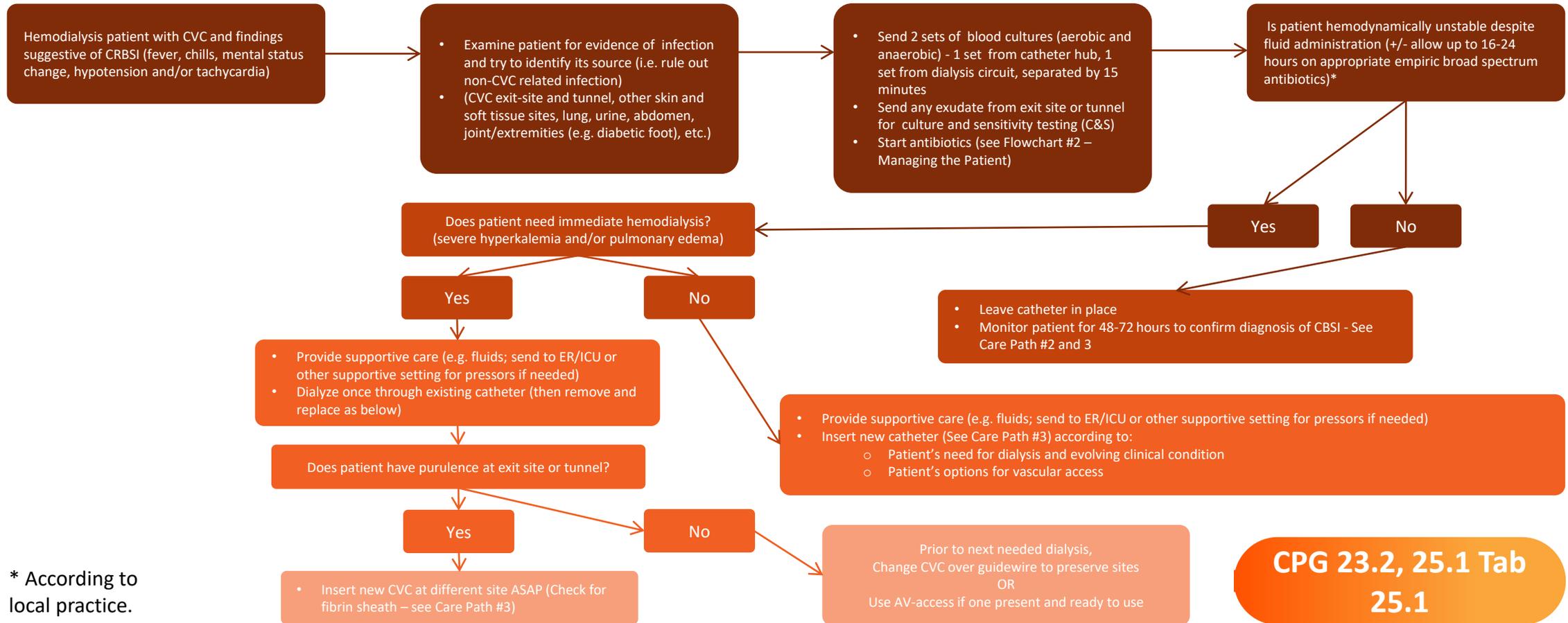
- Start empiric broad spectrum antibiotics
- FOLLOW UP culture and sensitivity results and change antibiotics accordingly
- As much as possible, provide IV antibiotics on dialysis and avoid PICCs (or use po antibiotics if appropriate)
- Treatment duration should be guided by type of infecting organism, type and degree of complications

Management: The Catheter

- Need for catheter removal is dependent on diagnostic findings and clinical scenario
- Catheter removal or exchange and location of new catheter depends on presence of exit site or tunnel infection, the patients ESKD Life-Plan, current and future access options
 - 3 possibilities:
 - 1) Catheter removal and insertion at new site (+/- Catheter free duration, which would require temporary catheter insertion)
 - 2) Catheter removal and new catheter via exchange over guidewire
 - 3) Catheter salvage with antibiotic locking for the same duration as systemic antibiotic coverage

Flow Diagram 25.a.

Immediate Approach to Suspected Hemodialysis Central Venous Catheter related Bloodstream infection (CRSBI)

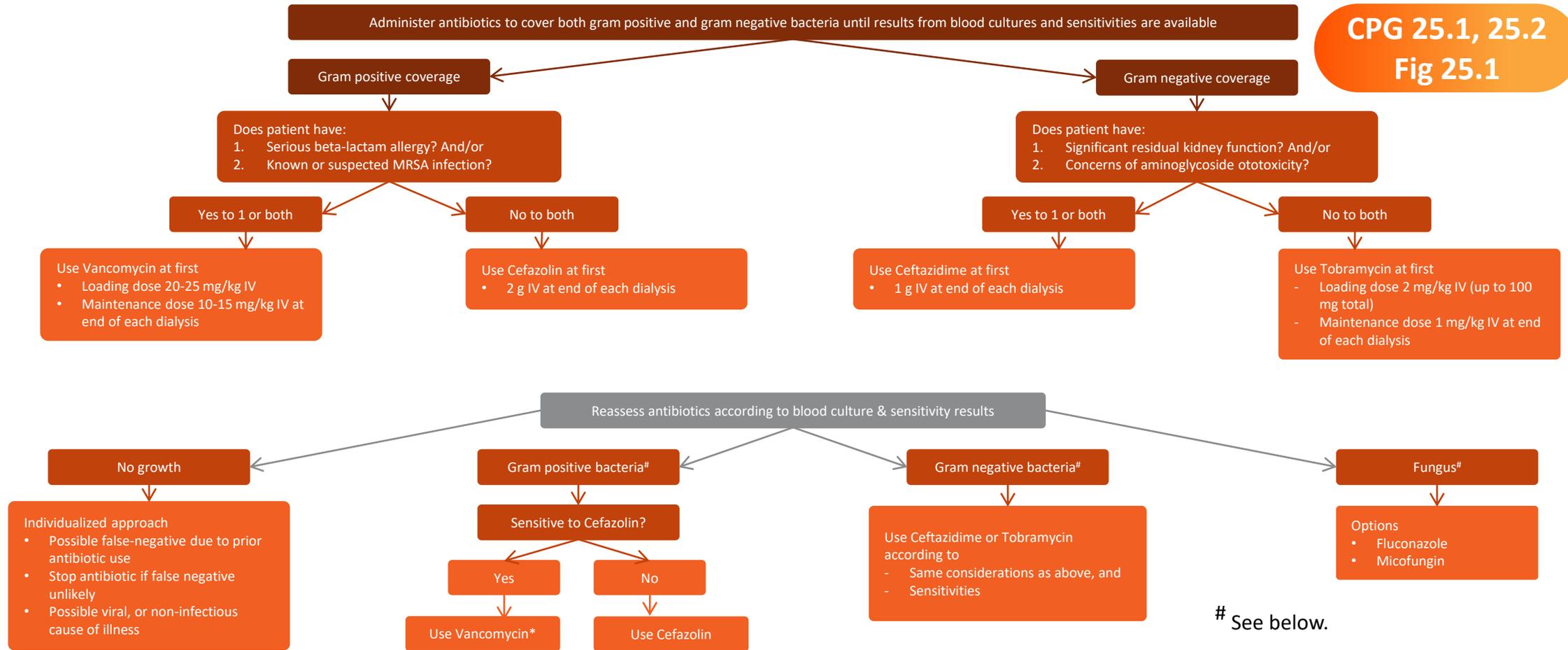


CPG 23.2, 25.1 Tab 25.1

Flow Diagram 25.b.

Manage the Patient: Empiric Initial and Subsequent Antibiotic Therapy for Hemodialysis Patient with Suspected CRSBI

CPG 25.1, 25.2
Fig 25.1



See below.

* Or according to sensitivity report and local antibiotic availability.

Table 25.a. for Flow Diagram 25.b. Manage the Patient: Subsequent Antibiotic Therapy for Hemodialysis Patient with CRBSI

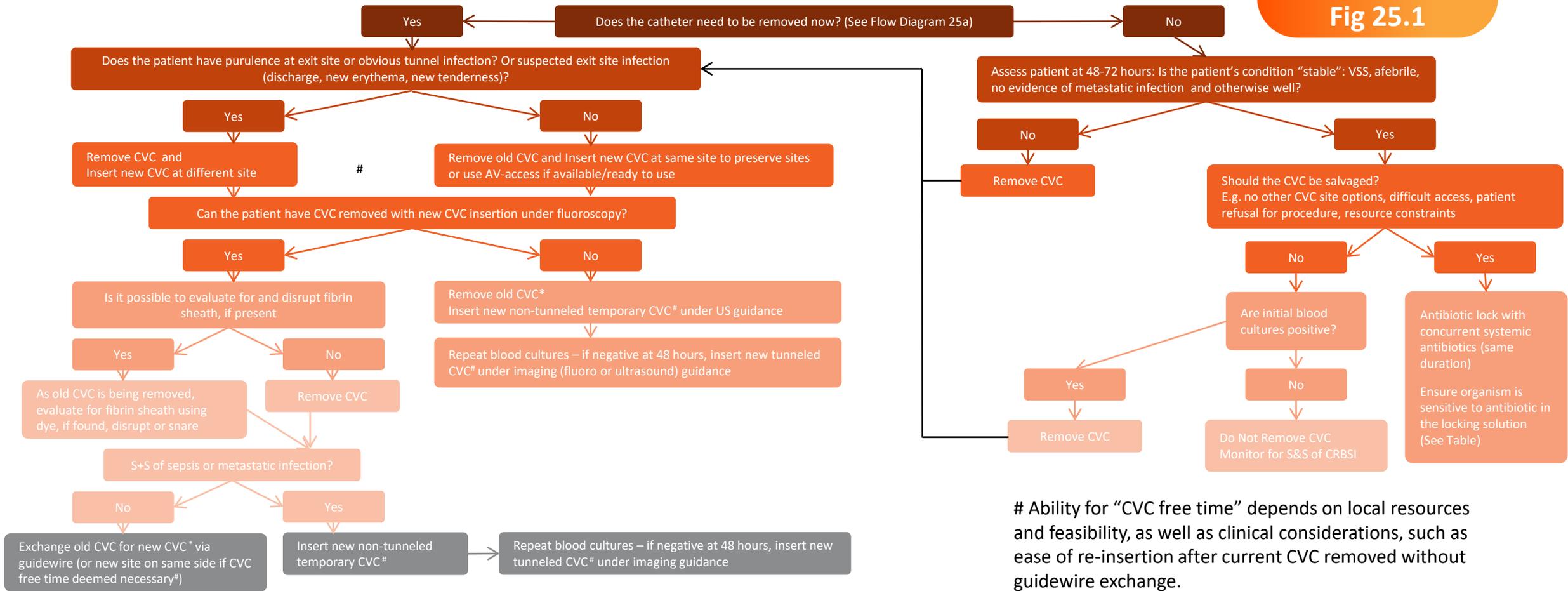
Infesting Organism	Duration of Treatment	Special Notes
Coagulase negative Staphylococcus	14 days	
Staphylococcus aureus	4-6 weeks	<ul style="list-style-type: none"> • Consider infectious diseases consult • Transthoracic 2D echo to evaluate for vegetations • Carefully monitor for metastatic infection • CVC should be removed
Gram negative organisms	14 days minimum	<ul style="list-style-type: none"> • Consider infectious diseases consult • CVC should be removed
Candida species	14 days minimum	<ul style="list-style-type: none"> • Consider infectious diseases consult • CVC should be removed (see Care Path # 3)

All: Re-evaluate CVC care e.g. connect/disconnect and dressing practices, and risk factors for CRBSI

Flow Diagram 25.c.

Manage the Catheter – Catheter Removal and Replacement in Hemodialysis Patient with Suspected CRBSI

CPG 25.1, 25.2
Fig 25.1



Ability for “CVC free time” depends on local resources and feasibility, as well as clinical considerations, such as ease of re-insertion after current CVC removed without guidewire exchange.

* Send old CVC tip for C&S if feasible, to confirm diagnosis of CRBSI.

Table 25.b. Antibiotic Lock Solutions for Treatment of CRBSI

Antibiotic	Anticoagulant	Comments
Vancomycin 50 mg/mL Reconstitute 500 mg vial of Vancomycin with 10 mL water for injection (to give concentration of 50 mg/mL) Draw up 1 mL (50 mg)	Citrate 4.67% (1 ml)	Draw up 1 mL of Trisodium Citrate 46.7 % and add to 1 mL of Vancomycin 50 mg/mL and 8 mL of Sodium Chloride 0.9% to give a total volume of 10 mL. Final concentration = 5 mg/ml Vanco and 4.67% Citrate in total vol 10 mL
Gentamicin (1 mg/mL) Draw up 0.25 mL (10 mg) of Gentamicin 40 mg/mL	Citrate 4.67% (1 ml) Draw up 1 mL of Citrate 46.7 % and add to 0.25 mL Gentamicin 40 mg/mL and 8.75 mL of Sodium Chloride 0.9% to give a total volume of 10 mL	Final concentration of Gentamicin 1 mg/mL and Citrate 4.67% in a total volume of 10 mL
Vancomycin 5 mg/mL + Ceftazidime 10 mg/mL	Heparin 1000 U/mL	Final concentrations: 2.5 mg/mL vancomycin 2.5 mg/mL ceftazidime 250 U/mL heparin
Vancomycin 5 mg/mL	Heparin 1000 U/mL	Final concentrations: 2.5 mg/mL vancomycin 500U/mL heparin
Ceftazidime 10 mg/mL	Heparin 1000 U/mL	Final concentrations: 2.5 mg/mL ceftazidime 500U/mL heparin
Cefazolin 10 mg/mL	Heparin 1000 U/mL	Final concentrations: 2.5 mg/mL cefazolin 500U/mL heparin