

ePlex BCID for Bloodstream Infections: Comprehensive Review

Antimicrobial Stewardship Workgroup, P&T CHaRGe
Microbiology & Infectious Disease Diagnostics

Today's Agenda

1. Introduction
2. Panel Results & Interpretation
3. Resistance Gene Quick Reference Table
4. Clinical Examples
5. Banner Antimicrobial Stewardship Resources

PART 1

Introduction

Benefits of Rapid Diagnostics

- Rapid, clinically actionable results allow for escalation or de-escalation of antimicrobial therapy
- Quick identification of drug-resistant organisms leads to proper treatment faster
- Timely intervention leads to improved patient outcomes and resource utilization

Roche ePlex Panel

- Blood culture identification (BCID): Rapid identification of microbes in blood cultures
 - Initial results in 2-4 hrs.* vs 24-72 hrs.
 - ePlex will replace nanosphere testing and provide additional rapid testing
 - Panels test for specific gram-positive, gram-negative and fungal organisms
- BCID test automatically performed by lab when blood culture has positive gram stain results; does not require separate provider order
- BCID tests for organisms and resistance markers—no specific susceptibility testing is performed with ePlex
 - Susceptibility testing is still completed as part of standard micro testing/reporting and will be available 48-72 hours after BCID results

*Test run time is 90 mins, but samples may have to be couriered to core micro lab, which may increase time to expected results

Panels

- Gram-positive (GP) panel: tests for 20 organisms, which includes some that may be associated with contaminated samples; 4 resistance markers
- Gram-negative (GN) panel: tests for 21 organisms; 6 resistance markers
- Fungal panel: 15 organisms, majority are *Candida spp.*
- Each panel includes testing for the other panels to ensure against gram stain misses & polymicrobial infections
 - If one of these is flagged as positive, the additional panel is tested
 - Example: positive result for *E. coli* on GN panel with Pan Gram Positive, then GP panel tested to identify organism

Gram-positive panel

Bacillus cereus group
Bacillus subtilis group
Corynebacterium
Cutibacterium acnes
Enterococcus
Enterococcus faecalis
Enterococcus faecium
Lactobacillus
Listeria
Listeria monocytogenes
Micrococcus
Staphylococcus
Staphylococcus aureus
Staphylococcus epidermidis
Staphylococcus lugdunensis
Streptococcus
Streptococcus agalactiae (GBS)
Streptococcus anginosus group
Streptococcus pneumoniae
Streptococcus pyogenes (GAS)

Resistance genes

mecA
mecC
vanA
vanB

Gram-negative panel

Acinetobacter baumannii
Bacteroides fragilis
Citrobacter
Cronobacter sakazakii
Enterobacter cloacae complex
Enterobacter (non-cloacae complex)
Escherichia coli
Fusobacterium necrophorum
Fusobacterium nucleatum
Haemophilus influenzae
Klebsiella oxytoca
Klebsiella pneumoniae group
Morganella morganii
Neisseria meningitidis
Proteus
Proteus mirabilis
Pseudomonas aeruginosa
Salmonella
Serratia
Serratia marcescens
Stenotrophomonas maltophilia

Resistance genes

CTX-M
IMP
KPC
NDM
OXA (groups 23 & 48)
VIM

Fungal pathogen panel

Candida albicans
Candida auris
Candida dubliniensis
Candida famata
Candida glabrata
Candida guilliermondii
Candida kefyr
Candida krusei
Candida lusitanae
Candida parapsilosis
Candida tropicalis
Cryptococcus gattii
Cryptococcus neoformans
Fusarium
Rhodotorula

**BCID panel only
tests for the most
common organisms**

Banner Micro Lab BCID Process

- BCID will be performed on initial positives based on Gram stain results
 - BCID will not be repeated during the same patient encounter unless a difference in Gram stain is observed (e.g., initial blood cultures with GN, subsequent blood cultures with GP)
- Testing will occur 24/7
 - If positive gram stain in blood culture, micro lab will order & perform BCID testing
 - Note: facilities with off-site micro labs will continue to send out positive samples for processing, which will now also include BCID
- Blood culture Gram stain results are called as critical calls
 - NOTE: No subsequent calls are made when the BCID panel is reported

PART 2

BCID Results & Interpretation

Resistance Genes

- Note: lack of resistance marker does not always equate to susceptibility

		ePlex BCID Panel	Description
Gram-Positive resistance genes	<i>mecA</i>	✓	Confers methicillin resistance in <i>Staphylococcus</i> species
	<i>mecC</i>	✓	
	<i>vanA</i>	✓	Confers vancomycin resistance in <i>Enterococcus</i> species
	<i>vanB</i>	✓	
Gram-Negative resistance genes	KPC	✓	Confers carbapenem resistance
	OXA	✓ Groups 23,48	
	IMP	✓	
	VIM	✓*	
	NDM	✓	
	CTX-M	✓*	Confers resistance to extended spectrum beta-lactams such as ceftriaxone (ESBL).

*VIM – all types detected except rare type 7; CTX-M all types detected except rare types 74, 75, 78

Resistance Genes

- Resistance genes predict phenotype, but susceptibilities should always be reviewed when available
- Lack of resistance gene does not guarantee susceptibility, especially in GNR organisms (many resistance mechanisms possible and only most common are tested in panel)

Resistance Gene	Organism	Phenotype Predicted and Accuracy of Prediction			
		Presence	Approx. Accuracy	Absence	Approx. Accuracy
mecA	<i>S. aureus</i>	MRSA	98-100%	MSSA	98-100%
vanA/B	<i>E. faecalis</i> <i>E. faecium</i>	VRE	95-100%	VSE	95-100%
CTX-M	<i>Enterobacteriales</i> <i>P. aeruginosa</i> <i>A. baumannii</i> <i>S. maltophilia</i>	ESBL-producing gram-negative organism	95-100%	N/A. The lack of detection does not predict susceptibility because many other mechanisms can lead to resistance.	50-95%
KPC, NDM, OXA-48, VIM, IMP	<i>Enterobacteriales</i> <i>P. aeruginosa</i> <i>A. baumannii</i>	Carbapenemase-producing gram-negative organism	95-100%	N/A. The lack of detection does not predict susceptibility because many other mechanisms can lead to resistance.	10-98%

BCID Results

- Results located only in Microbiology – All Results flowsheet
 - Listed under Blood Direct Detection
 - Refer to Panel Comment result for additional important details

NOTE: results will not be visible within the Microbiology - Cultures flowsheet

Vitals Labs/POCT **Microbiology - All Results** Microbiology - Cultures Pathology/Genetics Imaging Diagnostics

Flowsheet: INFECTIONOUS DISEASES Procedure Selection Level: INFECTIONOUS DISEASES


November

Navigator

BLOOD DIRECT DETECTION

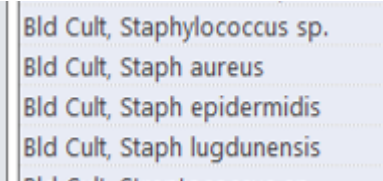
Show more results

INFECTIONOUS DISEASES		11/24/2025 16:54 MST
Bld Cult, Bacillus subtilis grp.		Not Detected
Bld Cult, Corynebacterium sp.		Not Detected
Bld Cult, Cutibacterium acnes (P.acnes)		Not Detected
Bld Cult, Enterococcus sp.		Not Detected
Bld Cult, Enterococcus faecalis		Not Detected
Bld Cult, Enterococcus faecium		Not Detected
Bld Cult, Lactobacillus sp.		Detected A
Bld Cult, Listeria sp.		Not Detected
Bld Cult, Listeria monocytogenes		Not Detected
Bld Cult, Micrococcus sp.		Not Detected
Bld Cult, Staphylococcus sp.		Not Detected
Bld Cult, Staph aureus		Not Detected
Bld Cult, Staph epidermidis		Not Detected
Bld Cult, Staph lugdunensis		Not Detected
Bld Cult, Streptococcus sp.		Not Detected
Bld Cult, Strep agalactiae		Not Detected
Bld Cult, Strep anginosus grp.		Not Detected
Bld Cult, Strep pneumoniae		Not Detected
Bld Cult, Strep pyogenes		Not Detected
Bld Cult, Pan Gram Positive		Not Detected
Bld Cult, MECA Methicillin Resist.		Not Detected
Bld Cult, MECC Methicillin Resist.		Not Detected
Bld Cult, VANA Vancomycin Resist.		Not Detected
Bld Cult, VANB Vancomycin Resist.		Not Detected
ePlex Gram Positive Panel Comment		See Comment *



Clinical Interpretation

- Organism identification
 - Lack of detected organism does NOT mean no infection
 - Some organisms list several species options: if specific species detected, both broader group and named species listed as detected
- Resistance markers
 - Lack of resistance markers seen on panel?
 - Refer to antibiograms for an agent with good empiric coverage; evaluate therapy once final susceptibilities available
 - Are resistance markers present that confer resistance to specific antimicrobials?
- Always refer to Panel result comments for additional treatment guidance
 - Comments may recommend therapy options based on organism present
 - Comments may indicate potential contamination → Evaluate patient to determine if continued therapy is needed; considerations:
 - More than one positive culture?
 - Is patient immunosuppressed?
 - Other clinical scenario (i.e., septic shock) that would warrant antimicrobial treatment until final culture results available?



Bld Cult, Staphylococcus sp.
Bld Cult, Staph aureus
Bld Cult, Staph epidermidis
Bld Cult, Staph lugdunensis

Clinical Interpretation

- Use all data points as pieces of the puzzle
 - Example – GN Panel results:
 - *Enterobacter cloacae* Detected
 - KPC marker Detected
 - Clinical interpretation of results:
 - *Enterobacter cloacae* is detected
 - If no resistance targets are detected, a Panel Comment would recommend treatment of *Enterobacter cloacae* with cefepime
 - **However**, panel results also indicate presence of KPC resistance marker, which takes precedence for antimicrobial choice
 - Panel comment recommends empiric use of ceftazidime-avibactam or meropenem-vaborbactam
 - Refer to resistance quick reference tables or Banner [Multidrug Resistant Organism](#) treatment document on the AMS Connect page

Treatment decision



BLOOD DIRECT DETECTION	
Bld Cult, Pan Candida	Not Detected
Bld Cult, Acinetobacter baumannii	Not Detected
Bld Cult, Bacteroides fragilis	Not Detected
Bld Cult, Citrobacter sp.	Not Detected
Bld Cult, Cronobacter sakazakii	Not Detected
Bld Cult, Enterobacter sp.	Not Detected
Bld Cult, E. cloacae complex	Detected A
Bld Cult, E. coli	Not Detected
Bld Cult, Fusobacterium nucleatum	Not Detected
Bld Cult, Fusobacterium necrophorum	Not Detected
Bld Cult, Haemophilus influenzae	Not Detected
Bld Cult, Klebsiella oxytoca	Not Detected
Bld Cult, Klebsiella pneumoniae	Not Detected
Bld Cult, Morganella morganii	Not Detected
Bld Cult, Neisseria meningitidis	Not Detected
Bld Cult, Proteus sp.	Not Detected
Bld Cult, Proteus mirabilis	Not Detected
Bld Cult, Pseudomonas aeruginosa	Not Detected
Bld Cult, Salmonella sp.	Not Detected
Bld Cult, Serratia sp.	Not Detected
Bld Cult, Serratia marcescens	Not Detected
Bld Cult, Stenotrophomonas maltophilia	Not Detected
Bld Cult, CTX-M	Not Detected
Bld Cult, IMP	Not Detected
Bld Cult, KPC	Detected A
Bld Cult, NDM	Not Detected
Bld Cult, OXA	Not Detected
Bld Cult, VIM	Not Detected
ePlex Gram Negative Panel Comment	See Comment f
Bld Cult, Pan Gram Positive	Not Detected

Clinical Interpretation

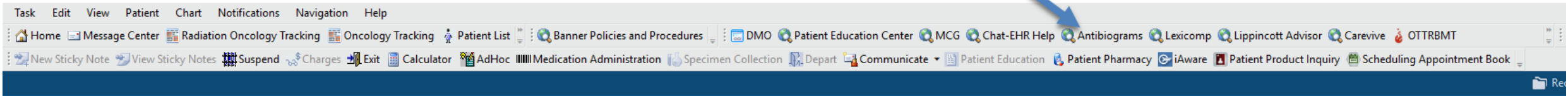
- Resistance marker interpretation cautions:
 - If more than one organism is present, it is difficult to determine which resistance marker is for a particular organism
 - Discrepancies between phenotypic or genotypic testing may result in additional testing
 - Patients' previous culture(s), susceptibility results, and multidrug resistant organism (MDRO) risk factors should be assessed in addition to BCID panel results

Provider Actions

- Review & interpret panel results after notification of gram stain results
- Refer to available antimicrobial stewardship resources:
 - [Local antibiograms](#) for empiric therapy options
 - [Drug-resistant organism recommendations](#) when resistance markers present
- Collaborate with pharmacists to make appropriate **early** adjustments to antimicrobial therapy based upon panel results
 - Does not require waiting for 24-48 hrs. for standard susceptibilities to result
 - Narrowing therapy when able decreases potential for adverse events and improves patient outcome
 - Early recognition of drug-resistance allows for more effective treatment and early implementation of infection prevention measures

Quick Access Antibigrams

- Antibigrams on Banner Connect are available through toolbar link in Cerner for ease of use



A screenshot of the Banner Connect 'Antibigrams' page. The page title is 'Antibigrams'. The left sidebar contains a navigation menu for 'Infection Prevention and Control' with sub-items: Isolation Guidelines, IP Policies, Ambulatory Resources, Cleaning and Disinfection, Hand Hygiene, Education Materials, Antibigrams (highlighted), Resources, Contact Us, Infection Preventionist's Toolkit, Diseases and Conditions, and HAI Annual Performance Measures. The main content area has a heading 'System Antibigrams' and a sub-heading 'Antimicrobial Stewardship Data Dashboard'. Below this is a section for 'Antibigrams Systemwide Data' with a dropdown menu showing 'AZ Ambulatory - SQL' and 'Arizona - Acute Facilities'. The page footer includes 'PAGE CONTACT INFORMATION' for Steven Watson, Director, Regional Infection Prevention.

Pharmacist Review

- Pharmacist receives notification of identified bug/drug mismatch based on BCID results
 - Review all BCID results and panel comments
- Intervention may include de-escalation/ narrowing of therapy or additional/modified therapy based on clinical interpretation of results and local susceptibility patterns

[Worklist rules explanations](#)

ZZZTEST, DTA TWO
11 yrs Female DOB: AUG 01, 2014 MRN: 7017625 FIN: 105368716

Alerts [Collapse All](#)

▼

▲ Rapid Micro Diagnostics Status

JAN 14, 2026 14:39

Severity: **▲ Severe**

Results

Order	Result
ePlex Gram Positive Panel Comment	See Comment
Normalcy	
ABN	

[Show History](#)

Pharmacy Worklist Expectations

Patient	↓	Location	Alerts	Tasks	Phar...
ZZZTESTWAYNE, BRUCE 86 yrs M DOB: MAY 23, 1939 FIN: 105353593 MRN: 7016254		Room: IPAC-02 Unit: 05 IPAC	⚙️ ⚠️ Rapid Dx ⚙️ ⓘ Weight		
ZZZTEST TEST 46 yrs F		Room: B215-01	⚙️ ⓘ Mismatch		

- All pharmacists are expected to add "Rapid Dx" alert category to worklist filters
- Pharmacist reviews results within **3 hours** and contacts provider if intervention is needed
 - Note: This may be the on-call provider if evening or overnight
- Complete worklist alert as "Completed/Not Duplicate"

Pharmacist Documentation

- Complete Worklist Alert *and Pharmacy Antimicrobials* Ad Hoc when intervention is needed based on BCID results
 - Completing documentation **every time** is critical for data tracking
 - Ensure documentation tells the **narrative**
 - Ad hoc regardless of whether recommendation is **accepted** or **rejected**
 - Document contacted provider name in appropriate field

Pharmacy Antimicrobials - ZZZBMMC, INPATIENT

*Performed on: 01/08/2026 13:46 MST

Antimicrobials

Note: For Dosage Adjustment (renal dosing), pharmacokinetics monitoring or IV to PO conversion, please use corresponding form

Prescribed drug(s)

<input type="checkbox"/> None	<input type="checkbox"/> cefOxitin	<input type="checkbox"/> Eravacycline	<input type="checkbox"/> Linezolid	<input type="checkbox"/> Sulfamethoxazole-Trimethoprim
<input type="checkbox"/> Acyclovir	<input type="checkbox"/> Ceftriaxone	<input type="checkbox"/> Ertapenem	<input type="checkbox"/> Meropenem	<input type="checkbox"/> Tetracycline
<input type="checkbox"/> Amikacin	<input type="checkbox"/> cefTAZidime	<input type="checkbox"/> Erythromycin	<input type="checkbox"/> Meropenem-Vaborbactam	<input type="checkbox"/> Tigecycline
<input type="checkbox"/> Amoxicillin	<input type="checkbox"/> Ceftazidime-Avibactam	<input type="checkbox"/> Ethambutol	<input type="checkbox"/> metroNIDAZOLE	<input type="checkbox"/> Tobramycin
<input type="checkbox"/> Amoxicillin-Clavulanate	<input type="checkbox"/> Ceftolozane-Tazobactam	<input type="checkbox"/> Fanciclovir	<input type="checkbox"/> Micafungin	<input type="checkbox"/> valACYclovir
<input type="checkbox"/> Amphotericin B	<input type="checkbox"/> ceFTRIAXone	<input type="checkbox"/> Fidaxomicin	<input type="checkbox"/> Minocycline	<input type="checkbox"/> valGANciclovir
<input type="checkbox"/> Ampicillin	<input type="checkbox"/> Cefuroxime	<input type="checkbox"/> Fluconazole	<input type="checkbox"/> Nafcillin	<input type="checkbox"/> Vancomycin
<input type="checkbox"/> Ampicillin-Sulbactam	<input type="checkbox"/> Cephalexin	<input type="checkbox"/> Flucytosine	<input type="checkbox"/> Nitrofurantoin	<input type="checkbox"/> Voriconazole
<input type="checkbox"/> Antimalarials	<input type="checkbox"/> Ciprofloxacin	<input type="checkbox"/> Fosfomycin	<input type="checkbox"/> Oseltamivir	<input type="checkbox"/> Other:
<input type="checkbox"/> Atovaquone	<input type="checkbox"/> Clarithromycin	<input type="checkbox"/> Fosfomycin	<input type="checkbox"/> Penicillin	
<input type="checkbox"/> Azithromycin	<input type="checkbox"/> Clindamycin	<input type="checkbox"/> Ganciclovir	<input type="checkbox"/> Piperacillin-Tazobactam	
<input type="checkbox"/> Aztreonam	<input type="checkbox"/> Colistin	<input type="checkbox"/> Gentamicin	<input type="checkbox"/> Polymyxin B	
<input type="checkbox"/> ceFAZolin	<input type="checkbox"/> Dalbapristin-Quinupristin	<input type="checkbox"/> Imipenem/cilastatin/relebactam	<input type="checkbox"/> Posaconazole	
<input type="checkbox"/> Cefdinir	<input type="checkbox"/> Dapsone	<input type="checkbox"/> Isavuconazole	<input type="checkbox"/> Pyrazinamide	
<input type="checkbox"/> Cefepime	<input type="checkbox"/> DAPTOMycin	<input type="checkbox"/> Isoniazid	<input type="checkbox"/> Rifabutin	
<input type="checkbox"/> Cefiderocol	<input type="checkbox"/> Diclloxacin	<input type="checkbox"/> Itraconazole	<input type="checkbox"/> rifAMPin	
<input type="checkbox"/> Cefotaxime	<input type="checkbox"/> Doxycycline	<input type="checkbox"/> levoFLUXacin	<input type="checkbox"/> Sulbactam-Durlobactam	

Intervention (justification)

<input type="radio"/> Cost effectiveness	<input type="radio"/> Drug not needed but prescribed	<input type="radio"/> Duplicate therapy	<input type="radio"/> Preferred agent	<input type="radio"/> Safety
<input type="radio"/> Course completed	<input type="radio"/> Drug needed but not prescribed	<input type="radio"/> Optimize therapy	<input type="radio"/> Prophylaxis	<input type="radio"/> Other:

Action

<input type="checkbox"/> Initiate therapy	<input type="checkbox"/> Change to alternative medication	<input type="checkbox"/> Desensitization
<input type="checkbox"/> Modify current therapy	<input type="checkbox"/> Add adjunct therapy	<input type="checkbox"/> Allergy de-labeled
<input type="checkbox"/> Discontinue therapy	<input type="checkbox"/> Order labs	<input type="checkbox"/> Discharge antimicrobial recommendations
<input type="checkbox"/> Review therapy	<input type="checkbox"/> Order tests	<input type="checkbox"/> Other:
<input type="checkbox"/> Add stop date	<input type="checkbox"/> Specialist consult	

Provider

Outcome

<input type="radio"/> Accepted	<input type="radio"/> Rejected - awaiting further culture or test results	<input type="radio"/> Rejected - secondary infection
<input type="radio"/> Contacted provider - awaiting call back	<input type="radio"/> Rejected - benefit > risk	<input type="radio"/> Rejected - specialist consult
<input type="radio"/> Consult	<input type="radio"/> Rejected - MD disagrees with recommendations	<input type="radio"/> Reviewed - no changes needed
<input type="radio"/> Per protocol	<input type="radio"/> Rejected - patient discharged	

Comments

Segue UI 9

PART 3

Resistance Quick Reference Table

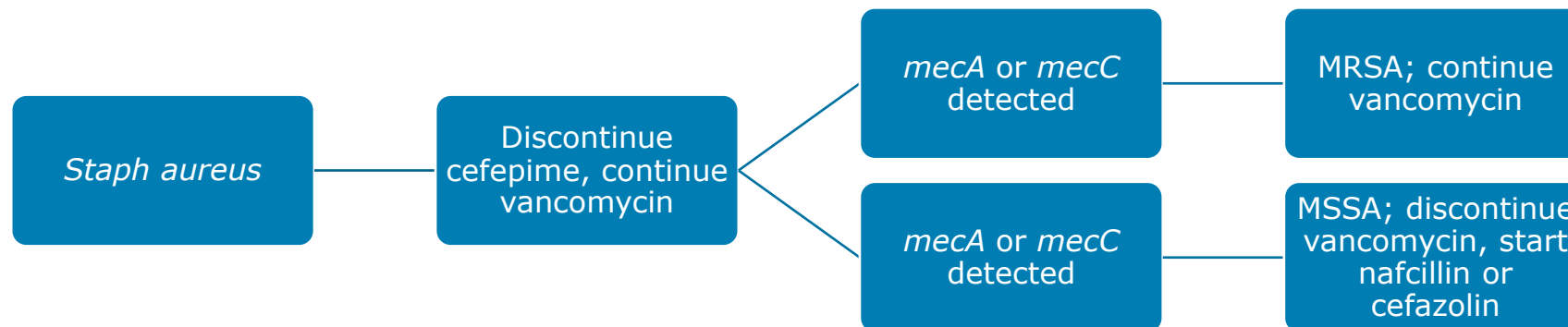
	Resistance Marker	Description	Recommendation
Gram-positive resistance genes	<i>mecA</i>	Markers for methicillin resistance in <i>Staph spp.</i>	If <i>not detected</i> , de-escalate to nafcillin or cefazolin
	<i>mecC</i>		
	<i>vanA</i>	Markers for vancomycin resistance in <i>Enterococci</i>	Note differences in the antibiotic susceptibilities for <i>E. faecium</i> and <i>E. faecalis</i> with VRE.
	<i>vanB</i>		
Gram-negative resistance genes	CTX-M	Associated with ESBL resistance	Treatment with a carbapenem recommended
	OXA	<i>Enterobacterales</i> species or <i>Acinetobacter</i> ; carbapenem-resistance	<i>Enterobacterales spp.</i> Initiate ceftazidime-avibactam <i>Acinetobacter baumannii</i> use a sulbactam containing regimen. Comments will help guide therapy
	VIM	Carbapenem resistance	Treatment with cefiderocol, ceftazidime-avibactam + aztreonam, or aztreonam-avibactam is recommended. MDRO document is useful for treatment recommendations
	IMP		
	NDM		

PART 4

Clinical Case Examples

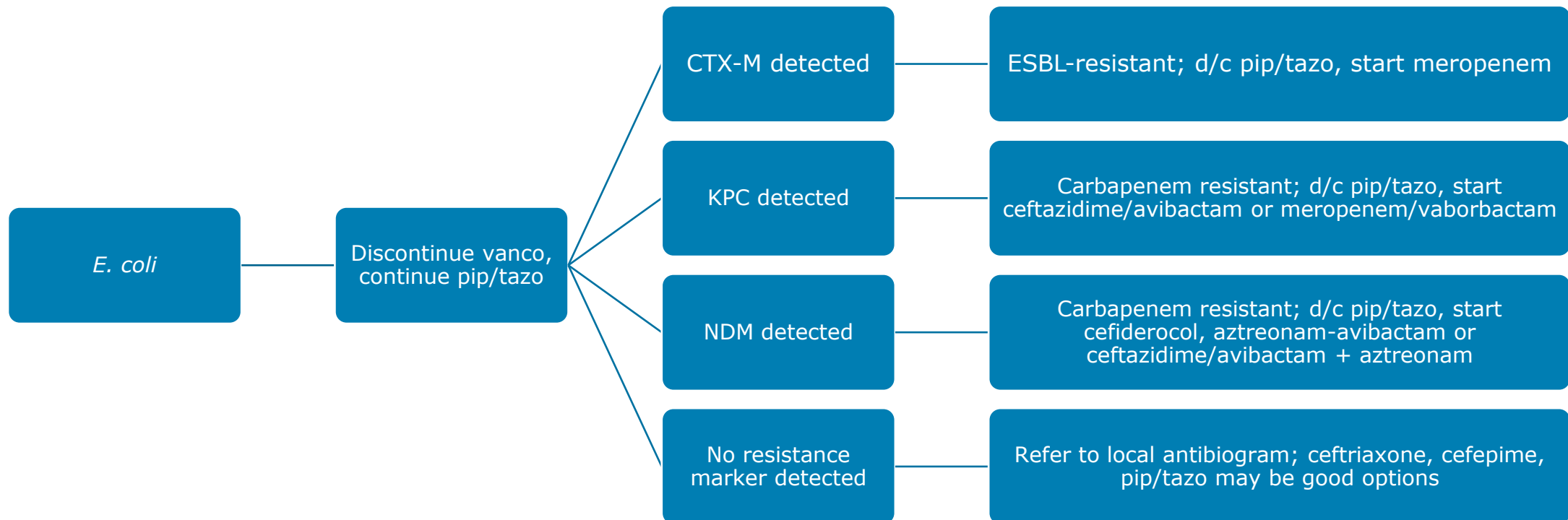
Case 1

- 56 y/o male, admitted for 3-day history of fever and malaise
- Empirically started on IV vancomycin + IV cefepime, pending additional workup
- Admission blood cultures positive for *Staphylococcus aureus*



Case 2

- 32 y/o female, admitted for severe flank pain, dysuria, fever
- Empirically started on IV vancomycin + IV pip/tazo
- Admission blood cxs positive for *E. coli*



PART 5

Banner Antimicrobial Stewardship Resources

Resources

- [Antimicrobial Stewardship, Banner Connect](#)
- [Banner Antibigrams](#)
- [Banner Gram-Negative Multidrug-Resistant Organism Recommendations](#)
- [Banner Multidrug Resistant Organisms Tracking and Trending](#)
- [BCID Results Tipsheet](#)

Questions? Contact facility antimicrobial stewardship lead

Thank you