



INHALE WP3: Antibiotic Prescribing Guidance for use with FilmArray Result

CONSIDERATIONS

- 1. Adjust dosages for renal function as per Manufacturer's SPC**
- 2. For patients already on antimicrobial treatment for infections necessitating specific regimens e.g. infective endocarditis/ meningitis - please discuss with Microbiology how best to adapt their treatment for organism(s) found by FilmArray.**
- 3. Pregnant and paediatric patients: Please note general recommendations regarding use of fluoroquinolones, tetracyclines, colistin, temocillin and ceftazidime-avibactam. See <https://www.medicines.org.uk/emc/> for specifics.**
- 4. Please be aware that Biofire FilmArray does not detect *Stenotrophomonas maltophilia*. If *S. maltophilia* infection is suspected please adjust therapy accordingly in at risk populations.**

Key

No known allergy to antibiotics

Mild allergy to β -lactams i.e. rash

Severe allergy to β -lactams, i.e. anaphylaxis

Not applicable

Table 1. To be used when ONE Organism is Detected by FilmArray

First <i>What organism was found & it the patient allergic to β-lactams</i>		Second <i>If NO resistance genes found, this is the advised R_x</i>	Third <i>If resistance genes found, this is your advised R_x</i>			
			Resistance Marker			
		None	CTX-M	KPC or OXA-48	IMP, NDM or VIM	<i>mecA</i> or <i>mecC</i>
	No organisms found	Antibiotics should be stopped unless there is clear evidence for probable or proven bacterial infection severe enough to warrant them				
	Any virus	Co-amoxiclav +antiviral if appropriate				
		Cefuroxime +antiviral if appropriate				
		Levofloxacin + antiviral if appropriate				

First <i>What organism was found & it the patient allergic to β-lactams</i>		Second <i>If NO resistance genes found, this is the advised R_x</i>	Third <i>If resistance genes found, this is your advised R_x</i>			
		None	CTX-M	KPC or OXA-48	IMP, NDM or VIM	<i>mecA</i> or <i>mecC</i>
	Any virus + 1 or more bacteria	Treat as indicated for bacterial infection and add antiviral treatment where appropriate				
Organism	<i>A. baumannii</i>	Meropenem ¹				
		Meropenem ¹				
		Colistin alone or in combination ² if clinically appropriate				
	<i>E. aerogenes, E. cloacae, E. coli, K. pneumoniae or K. oxytoca</i>	Temocillin (2g TDS)	Temocillin (2g TDS)	Ceftazidime-avibactam ³	Colistin alone or in combination ² if clinically appropriate	
		Ceftriaxone (<i>Klebsiella</i> spp. & <i>E. coli</i>) OR Meropenem for <i>Enterobacter</i> spp.	Meropenem	Ceftazidime-avibactam ³	Colistin alone or in combination ² if clinically appropriate	
		Levofloxacin or Ciprofloxacin	Colistin alone or in combination ² if clinically appropriate	Colistin alone or in combination ² if clinically appropriate	Colistin alone or in combination ² if clinically appropriate	
	<i>Proteus</i> spp. or <i>S. marcescens</i>	Piperacillin-tazobactam for <i>Serratia</i> sp. OR Temocillin 2g TDS for <i>Proteus</i> sp.	Temocillin 2g TDS for <i>Proteus</i> sp. OR Meropenem for <i>Serratia</i> sp.	Ceftazidime-avibactam ³	Fosfomycin ⁴	
		Ceftriaxone	Meropenem	Ceftazidime-avibactam ³	Fosfomycin ⁴	
		Fosfomycin ⁴	Fosfomycin ⁴	Fosfomycin ⁴	Fosfomycin ⁴	
	<i>H. influenzae</i>	Co-amoxiclav				
		Cefuroxime				
		Doxycycline OR Levofloxacin or Ciprofloxacin				

	<i>M. catarrhalis</i>	Co-amoxiclav				
		Cefuroxime				
		Doxycycline OR Levofloxacin or Ciprofloxacin				
	<i>P. aeruginosa</i>	Ceftazidime (2g TDS)	Meropenem	Ceftazidime-avibactam ³	Colistin alone or in combination ² if clinically appropriate	
		Ceftazidime (2g TDS)	Meropenem	Ceftazidime-avibactam ³	Colistin alone or in combination ² if clinically appropriate	
		Colistin alone or in combination ² if clinically appropriate	Colistin alone or in combination ² if clinically appropriate	Colistin alone or in combination ² if clinically appropriate	Colistin alone or in combination ² if clinically appropriate	
	<i>S. aureus</i>	Flucloxacillin ⁵				Glycopeptide ⁶ or Linezolid
		Cefuroxime				Glycopeptide ⁶ or Linezolid
		Glycopeptide ⁶ or Linezolid				Glycopeptide ⁶ or Linezolid
	<i>S. agalactiae, S. pneumoniae</i> or <i>S. pyogenes</i>	Amoxicillin				
		Cefuroxime				
		Glycopeptide ⁶ or Linezolid				
	<i>C. pneumoniae, L. pneumophila, M. pneumoniae</i>	Macrolide ⁷ OR Levofloxacin or Ciprofloxacin				
		Macrolide ⁷ OR Levofloxacin or Ciprofloxacin				
		Macrolide ⁷ OR Levofloxacin or Ciprofloxacin				

Footnotes

1. In units with high rates of carbapenem resistance, or if experiencing outbreak of carbapenem-resistant *A. baumannii* follow same recommendations as for treatment in case of allergy
2. Colistin can be combined with an appropriate second antimicrobial such as rifampicin or tigecycline. The choice is left open according to local preference.
3. Please discuss with microbiologist before prescribing
4. Consider adding colistin as metallo β -lactamase likely to be present in undetected host organism
5. If clinical picture suggests PVL-positive *S. aureus* consider ordering PVL test and switching to linezolid
6. Vancomycin or teicoplanin
7. Clarithromycin or azithromycin

Key

No known allergy to antibiotics

Mild allergy to β -lactams i.e. rash

Severe allergy to β -lactams, i.e. anaphylaxis

Not applicable

Table 2. Recommended treatment for combination of TWO or more organisms are detected by FilmArray

PLEASE READ THIS TABLE FROM LEFT TO RIGHT; Coloured boxes refer to allergy status as in Table 1.

Key: + organism present, - organism absent, \pm either present or absent

First, What combination of bacteria have been found?						Second: Therapy if no resistance genes	Third: if resistance genes found			
A. baumannii	Enterobacteriales: E. aerogenes, E. cloacae, E. coli, K. pneumoniae, K. oxytoca, Proteus sp., S. marcescens	P. aeruginosa	H. influenzae/M. catarrhalis	S. aureus	S. agalactiae, S. pneumoniae or S. pyogenes		mecA/C found	CTX-M found	C. pneumoniae, L. pneumophila OR M. pneumoniae	Carbapen- emase found
Does the mixture include <i>Acinetobacter</i> ? If YES ; stay with this block; if NO, go to next block										
+	Any one or more second organism found					Meropenem ⁸	Add Glycopeptide ¹⁰ OR Linezolid	-	Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin	Discuss with Micro- biology
+	\pm Any one or more second organism found					Meropenem ⁸	Add Glycopeptide ¹⁰ OR Linezolid	-	Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin	Discuss with Micro- biology
+	Add Levofloxacin or Ciprofloxacin ⁹	Add Levofloxacin or Ciprofloxacin ⁹	Add Levofloxacin or Ciprofloxacin ⁹	Add Glycopeptide ¹⁰ OR Linezolid	Add Glycopeptide ¹⁰ OR Linezolid	Colistin Combination	Add Glycopeptide ¹⁰ OR Linezolid	Discuss with Micro- biology	Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin	Discuss with Micro- biology

First, What combination of bacteria have been found?					Second:	Third: if resistance genes found				
A. baumannii	<i>E. aerogenes</i> , <i>E. cloacae</i> , <i>E. coli</i> , <i>K. pneumoniae</i> , <i>K. oxytoca</i> , <i>Proteus</i> sp., <i>S. marcescens</i>	<i>P. aeruginosa</i>	<i>H. influenzae</i> / <i>M. catarrhalis</i>	<i>S. aureus</i>	<i>S. agalactiae</i> , <i>S. pneumoniae</i> or <i>S. pyogenes</i>	Therapy if no resistance genes	<i>mecA/C</i> found	CTX-M found	<i>C. pneumoniae</i> , <i>L. pneumophila</i> OR <i>M. pneumoniae</i>	Carbapenemase found
If NO <i>Acinetobacter</i> : but ≥ 1 <i>Pseudomonas</i> /Enterobacteriales found start here										
-	+ (at least one)		±	±	±	Piperacillin/Tazobactam	Add Glycopeptide ¹⁰ OR Linezolid	Escalate to Meropenem	Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin	Discuss with Microbiology
-	+ (at least one)		±	±	±	Meropenem	Add Glycopeptide ¹⁰ OR Linezolid	-	Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin	Discuss with Microbiology
-	Add Levofloxacin or Ciprofloxacin ⁹	Add Levofloxacin or Ciprofloxacin ⁹	Add Levofloxacin or Ciprofloxacin ⁹	Add Glycopeptide ¹⁰ OR Linezolid	Add Glycopeptide ¹⁰ OR Linezolid	Colistin Combination as indicated	Add Glycopeptide ¹⁰ OR Linezolid	Discuss with Microbiology	Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin	Discuss with Microbiology
If NO <i>Acinetobacter</i> NO <i>Pseudomonas</i> & NO Enterobacteriaceae start here										
None of these		Any 2 or more of these			Co-amoxiclav	Add Glycopeptide ¹⁰ OR Linezolid		Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin		
None of these		Any 2 or more of these			Levofloxacin	Add Glycopeptide ¹⁰ OR Linezolid		Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin		
None of these		Any 2 or more of these			Levofloxacin	Add Glycopeptide ¹⁰ OR Linezolid		Add Macrolide ¹¹ OR Levofloxacin or Ciprofloxacin		

Footnotes

8. Add colistin in areas of high carbapenem-resistance among *A. baumannii*.
9. Consider adding tigecycline or fosfomycin if fluoroquinolone resistance locally prevalent
10. Vancomycin or teicoplanin
11. Clarithromycin or azithromycin