Guideline for reporting of antimicrobials for New Zealand microbiology laboratories

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Content

1. Aim

This document aims to provide a framework for diagnostic microbiology laboratories within New Zealand to implement important key principles when reporting antimicrobial susceptibility test results.

2. Background

Antimicrobial use selects for multi-drug resistant organisms which can spread from person-to-person and potentially limit available future treatment options. Many organisms will be susceptible to more than one class of antimicrobial tested in the microbiology laboratory. Using the narrowest spectrum effective antimicrobial to treat a given bacterial infection can limit the undesirable impact on colonising flora and the microbiome, where diversity of microbial species is beneficial to health. Published literature supports the concept that the antimicrobial susceptibilities reported by the

laboratory can directly influence which antimicrobial is prescribed by the clinician. One way to limit the prescription of antimicrobials with unnecessary broad spectrum of activity, or to direct the prescriber to the first line recommended antimicrobial choice, is for the laboratory to limit (or select) which of the antimicrobials tested are reported to the clinician.

A recent Royal College of Pathologists of Australasia Quality Assurance Programs (RCPAQAP) survey of antimicrobial reporting in Australian and New Zealand laboratories identified significant opportunities for improvement and standardization of 'cascade' or 'selective' reporting of antimicrobials. In particular, for a fully susceptible *Escherichia coli* in blood culture 65% of laboratories (55/84) over-reported at least one antimicrobial. Importantly, 15% (10/65) of laboratories that tested meropenem reported the result whilst 12% reported antimicrobials generally considered inappropriate for treatment of bacteraemia on blood culture isolates.

In 2019, the Royal College of Pathologists of Australasia (RCPA) published a Guideline for the Selective Reporting of Antimicrobials. This document was directed mainly at Australian laboratories and has herein been adapted for the New Zealand context.

3. Scope

This guidance has been adapted from the RCPA Guideline for the Selective Reporting of Antimicrobials. It is not intended for use outside of the New Zealand laboratory context. It is not compulsory for laboratories to adopt these recommendations but is endorsed by the New Zealand Microbiology Network (NZMN), the New Zealand National Antimicrobial Susceptibility Testing Committee (NZNAC) and the RCPA. Not all possible drug-bug reporting scenarios or multidrug resistant isolates are intended to be covered but, rather, the common examples. It is expected that laboratories follow appropriate antimicrobial susceptibility testing methods as described elsewhere by either the European Committee for Antimicrobial Susceptibility Testing (EUCAST) or the Clinical Laboratory Standards Institute (CLSI); this document does not replace clinical breakpoint documents. Individual reporting decisions will need to be based on all evidence available to the reporting pathologist and the extent of implementation of these recommendations will depend on many factors including local laboratory information system (LIS) capabilities, local antibiograms, demographic of the population being serviced by the laboratory, and local empiric treatment protocols and stewardship policies.

4. Guideline development

This guideline was developed by nominated members of the NZNAC, with assistance from other NZNAC and NZMN members. It was sent to all NZNAC and NZMN members, all New Zealand microbiology laboratories and the RCPA for consultation and comment.

5. Key reporting strategies

Reporting of antimicrobial agents that test as resistant is (in general) recommended, but a more selective approach to reporting agents that test as susceptible is also warranted, and is the main focus of these guidelines.

The following key reporting strategies should be recognised by laboratories and adhered to wherever possible and/or applicable:

1. Antimicrobial susceptibility reporting has a direct influence on prescribing practices by clinicians.
2. Antimicrobial susceptibility reporting should be restricted to clinically relevant isolates. Reporting susceptibility results for colonising flora, poor quality samples or contaminants must be avoided.
    i. Where doubt about the clinical significance of an isolate exists, the report may include a comment such as “Susceptibility results available on consultation with a clinical microbiologist”.
3. Antimicrobial agents which are not effective at the likely site of infection, as indicated by the sample type and/or clinical details, should not be reported.
4. Laboratories need not routinely report susceptibility results for intravenous antibiotics for community samples unless limited oral options are available.
5. Routine susceptibility testing results should, wherever possible, align with local antibiotic treatment guidelines.
6. Antibiotic agents which are used as indicator antibiotics for resistance mechanisms but which do not have clinical utility should not be directly reported.
7. Clinically relevant antimicrobial resistance should be identified and reported in all circumstances.

8. The narrowest spectrum effective antimicrobial agents and/or the agent with the least ecological impact should be preferentially reported, taking into account the activity of agents at the site of infection.
9. Reporting of quinolones, 3rd generation cephalosporins, piperacillin-tazobactam, clindamycin, and carbapenems should be limited to situations where other equally efficacious treatment options are unavailable.
10. Where allergy is indicated in the clinical details, alternative treatment options should be reported.
11. Clinical microbiologists should be available for clinical consultation regarding susceptibility testing results for all laboratories providing microbiology services.

6. Enterobacterales

6.1 Urine

Suggested antibiotics tested:
amoxicillin/co-amoxiclav/cefalexin/nitrofurantoin/trimethoprim/cefpodoxime (screen) +/-ciprofloxacin/gentamicin/ceftriaxone/ceftazidime/cefepime/piperacillin-tazobactam/meropenem/ertapenem/co-trimoxazole/fosfomycin/mecillinam.

Additional testing and reporting options for multidrug resistant isolates, e.g. ceftazidime-avibactam, should be discussed with the clinical microbiologist.

6.1.1 Community urine

i. If reporting susceptibilities always report trimethoprim and, if *E. coli*, nitrofurantoin.
ii. Report amoxicillin if tested.
iii. Report co-amoxiclav if resistant or limited other first line options.
iv. Report ciprofloxacin if resistant or no other oral options.
v. Report fosfomycin / pivmecillinam only if multi-drug resistant isolate with limited oral treatment options.
vi. ESBL/AmpC producers: report as per clinical breakpoints and but consider adding comment to indicate presence of an ESBL/AmpC when detected.
vii. Catheter urine: consider whether the isolate is significant, taking into account clinical details provided. If susceptibilities are released, add a comment stating that catheters are

frequently colonised and reporting of susceptibilities does not imply a treatment recommendation.

viii. Do not report trimethoprim or nitrofurantoin if pyelonephritis is noted in the clinical details. Alternatively, add a comment which states that trimethoprim and nitrofurantoin are recommended only for the treatment of cystitis and not for pyelonephritis.

Table 1. Enterobacterales community urine, clinically significant isolate

Susceptibility profile/ scenario[1]	AM[2]	AMC	CEX[2]	TRI	NIT	CIP	COT	FOS/MEC
Fully S	✓			✓	✓			
AM R	r	✓/×[4] R	✓	✓	✓	R		
AM/AMC R	r	r	✓	✓	✓	R		
ESBL/AmpC	r	✓/x R	r	✓	✓	✓/×[3] R	✓/×	✓/×[3] R
Pyelonephritis	✓	✓/×[4] R				✓/×[3] R	✓	

✓ = routinely report ✓/× = reporting optional R = report <u>if</u> resistant r = report <u>as</u> resistant

[1] Additional testing and reporting options for multidrug resistant isolates, should be discussed with the clinical microbiologist.

[2] If part of AST panel

[3]Report if limited other treatment options

[4]Report if AM R

6.1.2 Hospital urine

i. If reporting susceptibilities always report trimethoprim and, if E. *coli*, nitrofurantoin.
ii. Report amoxicillin if tested.
iii. Report co-amoxiclav if resistant or limited other first line options.
iv. Report ciprofloxacin if resistant or no other oral options.
v. Report fosfomycin / pivmecillinam only if multi-drug resistant isolate with limited oral treatment options.
vi. Report narrowest spectrum effective IV option +/- gentamicin.
vii. Only report third generation cephalosporins or piperacillin-tazobactam if resistant or isolate is resistant to all narrower spectrum β-lactams.
viii. ESBL/AmpC producers: can report as per clinical breakpoints but consider adding comment to indicate presence of an ESBL/AmpC when detected.

ix. Do not report trimethoprim or nitrofurantoin if pyelonephritis or sepsis are indicated in the clinical details. Alternatively, add a comment which states that trimethoprim and nitrofurantoin are recommended only for the treatment of cystitis and not for pyelonephritis.

x. Catheter urine: consider whether the isolate is significant, taking into account clinical details provided. If susceptibilities are released, add a comment stating that catheters are frequently colonised and reporting of susceptibilities does not imply a treatment recommendation.

Table 2. Enterobacterales hospital urine, clinically significant isolate

Susceptibility profile/ scenario[1]	AM[2]	AMC	CEX[2]	TRI	NIT	CIP	COT	GEN	CXM	CRO	MEM	ERT	PTZ	FOS/ MEC
Fully S	✓			✓	✓			✓/×	✓/×					
AM R	r	✓/× R	✓	✓	✓	R		✓/× R	✓/× R					
AM/AMC R	r	r	✓	✓	✓	R		✓/× R	✓				R	
CXM R	R	✓	r	✓	✓	R		✓/× R	r	✓			✓/× R	
ESBL/AmpC	r	✓/× R	r	✓	✓	✓/×[5] R	✓/×	✓	r	✓/× R	✓/×[5]	✓/×[5]	✓/× R	✓/×[5]
Pyelonephritis/sepsis	✓	✓/×[3] R				✓/×[4] R	✓	✓/× R	✓/×[3] R				R	

✓ = routinely report ✓/× = reporting optional R = report if resistant r = report as resistant

[1] Additional testing and reporting options for multidrug resistant isolates should be discussed with the clinical microbiologist.

[2] If part of AST panel

[3] Report if AM resistant

[4] Report if AM/AMC/COT resistant

[5] Report if limited other treatment options

6.2 Blood culture/sterile site

Suggested antibiotics tested:

amoxicillin/co-amoxiclav/cefuroxime/co-trimoxazole/gentamicin/cefpodoxime (screen) +/- ciprofloxacin/ceftriaxone/ceftazidime/cefepime/piperacillin-tazobactam/meropenem/ertapenem.

Additional testing and reporting options for multidrug resistant isolates, e.g, ceftazidime-avibactam, should be discussed with the clinical microbiologist.

i. Do not report antibiotics recommended for cystitis such as cephalexin, trimethoprim and nitrofurantoin.
ii. Always report amoxicillin.
iii. Report co-amoxiclav if resistant or if amoxicillin is resistant. Do not report co-amoxiclav if amoxicillin susceptible.
iv. Always provide an appropriate susceptible oral step-down agent where available.
v. Report ciprofloxacin if resistant or if no other oral options are available.
vi. Report narrowest spectrum effective IV option and gentamicin.
vii. Report third generation cephalosporins or piperacillin-tazobactam if resistant or isolate if is resistant to all narrower spectrum β-lactams.
viii. ESBL/AmpC producers: Do not report beta-lactam/beta-lactamase inhibitor combinations or 3rd generation cephalosporins, unless a cautionary comment is added to highlight the risk of development of resistance or inadequate clinical response.

Table 3. Enterobacterales blood culture/sterile site

Susceptibility profile/ scenario[1]	AM	AMC	CIP	COT	GEN	CXM	CRO	TZP	MEM	ERT
Fully S	✓			✓	✓	✓/×				
AM R	r	✓	R	✓	✓	✓				
AM/AMC R	r	r	R	✓	✓	✓		R		
CXM R	R	✓	R	✓	✓	r	✓	✓/× R		
ESBL/AmpC	r	R	✓/×[2] R	✓	✓	r	✓/×[3] R	✓/×[3] R	✓	✓/× R

✓ = routinely report ✓/× = reporting optional R = report if resistant r = report as resistant

[1] Additional testing and reporting options for multidrug resistant isolates should be discussed with the clinical microbiologist.

[2]Report if limited other treatment options

[3]If reported as susceptible, a cautionary comment should be added to highlight risk of resistance or inadequate response

6.3 Other sites (e.g superficial swabs, respiratory tract samples)

Suggested antibiotics tested:

amoxicillin/co-amoxiclav/cefuroxime/co-trimoxazole/gentamicin/cefpodoxime (screen) +/- ciprofloxacin/ceftriaxone/ceftazidime/cefepime/piperacillin-tazobactam/meropenem/ertapenem.

i. **Do not report susceptibilities unless the isolate is clinically significant, such as from a surgical wound, intra-abdominal infection, or ventilator associated pneumonia**.
    a. The vast majority of community isolates and non-surgical lower limb wound / ulcer isolates will not be clinically significant and are readily selected for by use of common empiric antibiotics. Susceptibilities may be made available on request only after discussion with a clinical microbiologist. Mixed Gram negative cultures may be reported as such, without provision of individual susceptibility results.

ii. Do not report antibiotics recommended for cystitis such as cefalexin, trimethoprim and nitrofurantoin.

iii. If reporting susceptibilities report amoxicillin.

iv. Report co-amoxiclav if resistant or if amoxicillin is resistant. Do not report co-amoxiclav if amoxicillin susceptible.

v. Do not report ciprofloxacin unless resistant or no other oral option available.

vi. If reporting susceptibilities report narrowest spectrum effective IV option +/- gentamicin.

vii. Report third generation cephalosporins or piperacillin-tazobactam if resistant or isolate is resistant to all narrower spectrum β-lactams.

viii. ESBL/AmpC producers: Do not report beta-lactam/beta-lactamase inhibitor combinations or 3rd generation cephalosporins unless a cautionary comment is added to highlight the risk of development of resistance or inadequate clinical response.

Table 4. Enterobacterales other sites, if isolate is clinically significant (not urine or blood cultures/sterile sites)

Susceptibility profile/ scenario[1]	AM	AMC	CIP	COT	GEN	CXM	CRO	TZP	MEM	ERT
Fully S	✓			✓	✓	✓/×[2]				
AM R	r	✓	R	✓	✓	✓				
AM/AMC R	r	r	R	✓	✓	✓		R		
CXM R	R	✓	R	✓	✓	r	✓	✓/× R		
ESBL/AmpC	r	R	✓/×[3] R	✓	✓	r	✓/×[4] R	✓/×[4] R	✓/× R	✓/× R

✓ = routinely report ✓/× = reporting optional R = report <u>if</u> resistant r = report <u>as</u> resistant

[1] Additional testing and reporting options for multidrug resistant isolates, should be discussed with the clinical microbiologist.

[2]Report if AM R

[3]Report if limited other treatment options

[4]If reported as susceptible, a cautionary comment should be added to highlight risk of resistance or inadequate response.

7. *Pseudomonas aeruginosa*

Suggested antibiotics tested:

Ciprofloxacin/ceftazidime/piperacillin-tazobactam/meropenem +/-
/cefepime/imipenem/tobramycin/amikacin/aztreonam.

Additional testing and reporting options for multidrug resistant isolates, e.g. ceftolozane-tazobactam, should be discussed with the clinical microbiologist.

7.1 Urine

7.1.1 Community urine

i. *Pseudomonas aeruginosa* is an uncommon cause of community infection unless complicating factors are present, such as urinary tract instrumentation.
ii. Report ciprofloxacin if clinical details indicate recent urinary tract instrumentation/complicated urinary tract, or if resistant.
iii. Catheter urine: consider whether the isolate is significant, taking into account the clinical details provided. If susceptibilities are released, add a comment stating that indwelling urinary catheters are frequently colonised and reporting of susceptibilities does not imply a treatment recommendation.

7.2.2 Hospital urine

i. Report susceptibilities only if the clinical details provided indicate the isolate is clinically significant isolate, or if resistant.
ii. Report carbapenem if resistant to ciprofloxacin, ceftazidime and piperacillin-tazobactam, or if resistant.
iii. Catheter urine: consider whether the isolate is significant, taking into account the clinical details provided. If susceptibilities are released, add a comment stating that indwelling

urinary catheters are frequently colonised and reporting of susceptibilities does not imply a treatment recommendation.

7.2 Blood culture/sterile site

i. Always report ceftazidime, piperacillin-tazobactam and ciprofloxacin.
ii. Report carbapenem if resistant to ceftazidime and piperacillin-tazobactam, or if resistant.
iii. Ensure the report indicates that increased exposure to ceftazidime, piperacillin-tazobactam and ciprofloxacin is required for effective treatment; the addition of specific dosing recommendations can also be considered.

7.3 Other (e.g superficial swabs, respiratory tract samples)

i. Susceptibility testing and reporting of mucoid isolates should be avoided due to poor reproducibility of results and limited correlation with clinical response.
ii. Do not report susceptibilities unless the isolate is clinically significant, such as from a surgical wound, intra-abdominal infection, or ventilator associated pneumonia.
    a. Do not routinely report susceptibility results from leg ulcers since colonisation is common and is best managed by good wound cares. Add a comment advising against the use of systemic antibiotics for colonised chronic ulcers.
    b. Do not routinely report susceptibility results from sputum if the sample is of poor quality (as determined by sputum microscopy) or unless clinical details are suggestive of pneumonia/infective exacerbation of chronic lung disease.
iii. For a clinically significant isolate, report carbapenem if resistant to ceftazidime and piperacillin-tazobactam, or if resistant.

Table 5. *Pseudomonas aeruginosa*

Susceptibility profile/ scenario[1]	CIP	PTZ	CAZ	MEM	FEP	IMI	TOB
Community urine, if clinically significant	✓						
Hospital urine, if clinically significant	✓	✓/× R	✓/× R	R	✓/× R	R	
Blood culture	✓	✓	✓	R	✓/× R	R	✓/×[2]

Sputum/swabs, if clinically significant	✓	✓/× R	✓	R	✓/× R	R	✓/×[2]
TZP and CAZ R	✓	r	r	✓	✓/× R	✓/× R	✓/×[2]

✓ = routinely report ✓/× = reporting optional R = report if resistant r = report as resistant

[1] Additional testing and reporting options for multidrug resistant isolates should be discussed with the clinical microbiologist.

[2]Reporting generally restricted to multi-resistant isolates with limited other options, or cystic fibrosis sputum samples

8. *Staphylococcus* spp

Suggested antibiotics tested:

Penicillin/cefoxitin (flucloxacillin)/erythromycin/tetracycline (doxycycline)/co-trimoxazole +/- clindamycin/vancomycin/teicoplanin/ciprofloxacin/rifampicin/fusidic acid/linezolid/daptomycin.

8.1 *Staphylococcus aureus* (all sites)

i. Susceptibilities should routinely be reported.
ii. Report penicillin if tested.
iii. Do not routinely report clindamycin for penicillin-susceptible (PSSA) or methicillin-susceptible *S. aureus* (MSSA) unless resistant or limited other oral options.
iv. If methicillin-resistant *S. aureus* (MRSA) is present, indicate with a comment that resistance to other β-lactam antibiotics is also predicted.
v. Do not routinely report ciprofloxacin, rifampicin and fusidic acid unless from a prosthetic joint infection, or unless the isolate is an MRSA and resistant to those agents.
vi. Report vancomycin, linezolid and daptomycin only for MRSA isolates.
vii. Report vancomycin only if an MIC method has been used.

8.2 Coagulase negative staphylococci

i. **Do not report susceptibilities unless clinically significant isolate such as repeated positive blood culture isolate, culture from a prosthetic device, indwelling venous catheter or neonate.**

ii. A single positive blood culture isolate without the presence of an indwelling venous catheter or prosthetic device should not routinely have susceptibilities reported since blood culture contamination is common.

iii. Mixed coagulase negative staphylococci from non-sterile sites do not routinely require susceptibility testing and may represent mixed skin flora.

Table 6. *Staphylococcus* spp

Susceptibility profile/ scenario	PEN[1]	FLU[2]	ERY	COT	DOX	CLIN	VAN[3]	CIP	RIF	FUS	Linezolid/ Daptomycin	Ceftaroline
PSSA/MSSA	✓	✓	✓/× R	✓/× R	✓/× R	R						
PSSA/MSSA bacteraemia	✓	✓	✓/×[4] R	✓/×[4] R	✓/×[4] R	R						
PSSA/MSSA prosthetic joint infection	✓	✓	✓/× R	✓/× R	✓/× R	✓/× R		✓	✓	✓		
MRSA	r	r	✓	✓	✓	✓/× R	✓/×[5]	R	R	R	✓/×[5]	
MRSA bacteraemia	r	r	✓/×[4] R	✓/×[4] R	✓/×[4] R	✓/×[4] R	✓				✓/×[5]	✓/×[5]
MRSA prosthetic joint infection	r	r	✓	✓	✓	✓	✓	✓	✓	✓	✓/×[5]	✓/×[5]
CoNS bacteraemia (if significant)	r	✓	✓/× R	✓/× R	✓/× R	✓/× R	✓				✓/×[5]	
CoNS prosthetic joint infection	r	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓/×[5]	

✓ = routinely report ✓/× = reporting optional R = report if resistant r = report as resistant

[1]If part of AST panel

[2]Test cefoxitin +/- oxacillin but report flucloxacillin [3]Report only if MIC method used

[4]If allergy to beta lactam and other step down oral therapy options required [5]Report if limited other treatment options

9. *Streptococcus pneumoniae*

Suggested antibiotics tested:

Oxacillin (penicillin)/amoxicillin/erythromycin/co-trimoxazole/tetracycline (doxycycline) +/- penicillin minimum inhibitory concentration (MIC)/amoxicillin MIC/ ceftriaxone MIC/ vancomycin/ moxifloxacin.

9.1 Sterile site

i. For CSF isolates, provide a penicillin susceptibility interpretation for meningitis breakpoints only.

ii. For blood culture isolates, include a penicillin susceptibility interpretation for both meningitis and non-meningitis infection unless the site of infection is known.

9.2 Other (respiratory tract sample, ear swab, eye swab)

i. Do not routinely report susceptibility results from sputum if the sample is of poor quality (as determined by sputum microscopy).

ii. Test ampicillin but report amoxicillin because ampicillin is not available for clinical use.

Table 7. *Streptococcus pneumoniae*

Susceptibility profile/ scenario	PEN	AM	ERY	COT	DOX	CRO	VAN	MOX
CSF	✓[1]					✓	✓/×	
Blood culture/sterile site PEN S	✓[2]							
Blood culture/sterile site PEN R	r	✓				✓	✓/×	
Sputum PEN S	✓	✓/× R	✓/× R	✓/× R	✓/× R			
Sputum PEN R	r	✓	✓	✓	✓	✓/×[3] R		✓/×[4]

✓ = routinely report ✓/× = reporting optional R = report if resistant r = report as resistant

[1]Report using meningitis breakpoints only

[2]For blood cultures, report using both meningitis and non-meningitis breakpoints

[3]Report if hospital patient and AM resistant

[4]Report if limited other treatment options

10.Streptococci groups A, B, C, and G

i. Susceptibility testing is not routinely required unless from a sterile site, if part of a mixed culture with MRSA, or if allergy to β-lactam antibiotics is stated on the request form.

ii. Where susceptibility results are not performed, a comment should be added stating that isolates are predictably susceptible to penicillins, cefazolin and cefalexin.

11. *Haemophilus influenzae*

Suggested antibiotics tested:

Penicillin (screen)/amoxicillin/co-amoxiclav/co-trimoxazole/tetracycline (doxycycline) +/-

ciprofloxacin/ceftriaxone/piperacillin-tazobactam.

11.1 CSF/blood culture

i. Do not report as susceptible or resistant to penicillin.

ii. Report as amoxicillin resistant if beta-lactamase positive.

iii. Report co-amoxiclav if amoxicillin resistant / β-lactamase positive, or if resistant.

11.2 Other (respiratory tract samples, ear swabs, eye swabs)

i. Report organism / susceptibilities if the isolate is predominant (sputum) and clinically significant.

ii. Do not routinely report susceptibility results from sputum if the sample is of poor quality (as determined by sputum microscopy).

iii. Susceptibilities need not be routinely reported from eye and ear swabs if no clinical indication of cellulitis, since topical therapy will be more commonly used.

iv. Test ampicillin but report amoxicillin because ampicillin is not available for clinical use.

v. Report as amoxicillin resistant if beta-lactamase positive.

vi. Report co-amoxiclav if resistant or amoxicillin resistant / β-lactamase positive.

vii. Report 3rd generation cephalosporin for hospital isolates if resistant, or if co-amoxiclav resistant.

Table 7. *Haemophilus influenzae*

Susceptibility profile/ scenario	AM	AMC	COT	DOX	CIP	CRO	PTZ
CSF PEN S	✓					✓	
CSF beta-lactamase positive or PBP3	r	R				✓	R
Blood culture PEN S	✓						
Blood culture beta-lactamase positive or PBP3	r	✓	✓			✓/×[1]	R
Sputum PEN S	✓		✓/× R	✓/× R			
Sputum beta-lactamase positive or PBP3	r	✓	✓	✓	✓/×[2]	✓/×[3]	

✓ = routinely report ✓/× = reporting optional R = report if resistant r = report as resistant

[1]Report if AMC resistant

[2]Report only if limited other treatment options

[3]Report if hospital patient and AMC resistant

APPENDIX 1. Common antibiotic agents, route of administration and abbreviation

The table below lists antibiotics in common usage and the route of administration. An abbreviation is provided to aid interpretation of antibiotic reporting tables in section 10.

Antimicrobial	Route (oral, intravenous (IV), or both)	Abbreviation
Amoxicillin	Both	AM
Cefpodoxime	NA	CPD
Ceftazidime	IV	CAZ
Ceftriaxone	IV	CRO
Cefuroxime	IV	CXM
Cefepime	IV	FEP
Cephalexin	Oral	CEX
Ciprofloxacin	Both	CIP
Clindamycin	Both	CLIN
Co-amoxiclav	Both	AMC
Co-trimoxazole	Oral	COT
Doxycycline	Oral	DOX
Ertapenem	IV	ERT
Erythromycin	Oral	ERY

Flucloxacillin	Both	FLU
Fosfomycin	Both	FOS
Gentamicin	IV	GEN
Mecillinam	Oral	MEC
Meropenem	IV	MEM
Moxifloxacin	Oral	MOX
Nitrofurantoin	Oral	NIT
Penicillin	Both	PEN
Piperacillin-tazobactam	IV	PTZ
Trimethoprim	Oral	TRI
Vancomycin	IV	VAN

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