

## Antimicrobial Susceptibility Definition

European Committee on Antimicrobial Susceptibility Testing (EUCAST) has made significant changes to the interpretation of antimicrobial susceptibility testing, in particular, 'I' now refers to 'Susceptible, Increased Exposure' and no longer indicates 'intermediate' susceptibility or uncertain therapeutic effect.

Susceptible	S	Susceptible, standard dosing regimen
	I	Susceptible, increased exposure* (increased dose)
Resistant	R	Resistant

The following revised definitions of 'S', 'I' and 'R' now apply:

**'S' Susceptible, standard dosing regimen** : A microorganism is categorised as 'S' when there is a high likelihood of therapeutic success using a standard dosing regimen of the agent.

**'I' Susceptible, increased exposure \***: A microorganism is categorised as 'I' when there is a high likelihood of therapeutic success because exposure to the (antimicrobial) agent is increased by adjusting the dosing regimen or by its concentration at the site of the infection.

**'R' Resistant** : A microorganism is categorised as 'R' when there is a high likelihood of therapeutic failure even when there is increased exposure.

\*Exposure is a function of how the mode of administration, dose, dosing interval, infusion time, as well as distribution and excretion of the antimicrobial agent will influence the infecting organism at the site of infection.

### Antibiotic dosing according to SITE OF INFECTION:

\*\*\*For complicated/deep-seated infections such as meningitis, infective endocarditis, implant infections or systemic/severe infections, high dose systemic antimicrobials are required to achieve therapeutic success. Please discuss with Clinical Microbiologist for further advice.\*\*\*

## Frequently asked Questions: What does 'I' Susceptible, increased exposure mean?

### Common examples of increased dose regimens for specific bacteria/antibiotics

#### *Pseudomonas aeruginosa*

- Will only be reported either as 'I' Susceptible, increased exposure or 'R' resistant to commonly use antibiotics i.e. Piperacillin/Tazobactam, Ceftazidime, Aztreonam and Ciprofloxacin. There is no longer 'S' category for these antibiotics for *P. aeruginosa*.
- 'I' Susceptible, increased exposure : infection can be treated with high dose antimicrobial regimens i.e. an increased dosing interval of Piperacillin/Tazobactam of 4.5g QDS IV or increased dose of Ceftazidime 2g TDS IV (dose adjustment are required for renal/liver impairment). It does NOT indicate escalation to Meropenem (restricted agent).

#### *Haemophilus influenzae (ORAL amoxicillin and ORAL Co-amoxiclav)*

- Will only be reported either as 'I' Susceptible, increased exposure or 'R' resistant to ORAL Amoxicillin or ORAL Co-amoxiclav. There is no longer 'S' category for ORAL Amoxicillin or ORAL Co-amoxiclav for *H. influenzae* .
- 'I' Susceptible, increased exposure to ORAL Amoxicillin: infection can be treated with increased dose of oral Amoxicillin 750mg-1g TDS PO or standard dose of IV Amoxicillin. It does NOT indicate escalation to Co-amoxiclav.
- 'I' Susceptible, increased exposure to ORAL Co-amoxiclav: infection can be treated with increased dose of Co-amoxiclav 875/125mg TDS PO, or Co-amoxiclav 625mg TDS PO PLUS Amoxicillin 500mg TDS PO or a standard dose of IV Co-amoxiclav. It does NOT indicate escalation to IV Piperacillin/Tazobactam.

### Antibiotic dosing according to SITE OF INFECTION:

\*\*\*For complicated/deep-seated infections such as meningitis, infective endocarditis, implant infections or systemic/severe infections, high dose systemic antimicrobials are required to achieve therapeutic success. Please discuss with Clinical Microbiologist for further advice.\*\*\*

### Common examples of increased dose regimens when susceptibility reported as 'I' Susceptible, increased exposure.

Bacteria	Antibiotics	Increased dose regimen	Comments
<i>Pseudomonas aeruginosa</i>	Piperacillin + tazobactam IV	4.5g QDS	Consider if local infection for critical illness
	Ceftazidime IV	2g TDS	
	Ceftazidime PO	2g TDS	Refer to drug safety team notes & JCCU
	Piperacillin IV	4g TDS	Caution with use
<i>Haemophilus influenzae</i>	Amoxicillin PO	750mg-1g TDS	
	Co-amoxiclav PO	Option 1: Co-amoxiclav 625mg TDS PLUS Amoxicillin 500mg TDS Option 2: Co-amoxiclav 875/125mg TDS	Option 1 or 2 depend on antibiotic bioavailability Option 1 would lead to an increase in amoxicillin consumption

*Note: Dosing recommendations are for adult patients with normal renal/liver function. Higher than standard dosing of some antibiotics may be required for severe infections. Please contact the Clinical Microbiology Team for further advice if required. Table adapted from: Scottish Antimicrobial Prescribing Group (SAPG) and the Scottish Microbiology and Virology Network (SMVN).*