

Guidelines for Empiric Treatment of Infections in the Intensive Care Unit

* *Restricted antibiotic – must discuss with microbiology and get an authorisation code within 24 hours of starting treatment*

On admission to ITU, complete a full antibiotic history in relation to the active infection. Ensure adequate source control where possible (i.e. drainage of collections or abscesses). Consider other causes of systemic deterioration e.g. recent surgical intervention, acute on chronic respiratory disease.

Use existing protocols for dosing of vancomycin and gentamicin

Illness/Treatment	Antibiotic Recommendation (Doses IV unless stated)	Comments
Sepsis of Unknown Focus	Co-amoxiclav 1.2g x 3 PLUS Gentamicin – ADD vancomycin if MRSA known or suspected In penicillin allergy * Levofloxacin 500mg x 2 PLUS Metronidazole 500mg x 3 PLUS Vancomycin (covers MRSA) Second line: use option for penicillin allergy or switch * levofloxacin for aztreonam 1g x 3 daily (Requires vancomycin for MRSA cover)	If strong suspicion of group A Strep or Staph Toxic Shock Syndrome, consider using immunoglobulin (discuss with microbiology) Dose 1g/kg day 1, 0.5g/kg days 2 and 3
Community Acquired Pneumonia <i>Hospital admission within 48 hours of infection onset</i>	Co-amoxiclav 1.2g x 3 PLUS Clarithromycin 500mg x 2 In penicillin allergy * Levofloxacin* 500mg x 2 (single agent) Second line: use penicillin allergy alternative or discuss with microbiology	If patient has following risk factors treat as per HAP protocol rather than CAP <ul style="list-style-type: none"> - recent hospital admission - recent antibiotic therapy
Hospital Acquired Pneumonia <i>Symptom onset ≥ 48 hours after admission</i>	Aztreonam 2g x 3 PLUS Vancomycin Second line: Ciprofloxacin 400mg x 2 PLUS Vancomycin	
Severe Pneumonia where MSSA or MRSA is suspected <i>e.g. recent influenza infection or IV drug user</i>	Discuss with microbiologist ADD Vancomycin PLUS Rifampicin IV 300mg x 2	For treatment of microbiologically proven MSSA pneumonia ADD flucloxacillin 2g x 4
Suspected necrotising staphylococcal lung infection	Suspect Panton-Valentine Leukocidin (PVL) toxin producing <i>S. aureus</i> strain ADD * clindamycin* IV 1.2g x 4	If deteriorating or severe disease consider IV immunoglobulin (see above)
Aspiration Pneumonia <i>Aspiration often leads to chemical pneumonitis – use antibiotics only treat where infection suspected.</i>	Metronidazole 500mg x 3 PLUS amoxicillin 1g In penicillin allergy metronidazole 500mg x 3 PLUS clarithromycin 500mg x 2 Severe infection ADD gentamicin In penicillin allergy * Levofloxacin 500mg x 2 PLUS metronidazole 500mg x 2 Second line: use penicillin allergy option or switch levofloxacin to aztreonam 1g x 3 PLUS vancomycin	Infection indicated by change in sputum quality to purulent/mucropurulent or fever and new chest X-ray changes Stop gentamicin after 3 days if no evidence of gram negative infection
Intra-abdominal Sepsis	Gentamicin PLUS amoxicillin 1g x 3 PLUS metronidazole 500mg x 3 In penicillin allergy Ciprofloxacin 400mg x 2 PLUS vancomycin PLUS metronidazole 500mg x 3 Second line: use penicillin allergy option or use aztreonam 1g x 3 in place of ciprofloxacin or gentamicin	Discuss with microbiologist if illness unresponsive or severe illness

Matrix of selected antimicrobial/antibacterial agent combination activity for ITU Information

Drug (alphabetical)	Gram Positive								Gram negatives					Atypicals (Mycoplasma, Chlamydia)	Renal Dys ⁿ		Notes
	MRSA	<i>Staph aureus</i>	Coag neg staph	Streps	<i>Ent faecalis</i>	<i>Ent faecium</i>	VRE	Anaerobes	Coliforms	Resp (<i>H. Influenzae</i> etc)	<i>Pseudomonas</i>	ESBL	Reduce dose in renal impairment?		Reduce dose in RRT?		
Aztreonam														Y	Y	No gram positive cover, check ESBL sensitivity	
Chloramphenicol														N	N	Risk of aplastic anaemia	
Ciprofloxacin														N	N	Poor gram positive cover, pro-convulsive, interactions	
Co-amoxiclav														Y	Y	High risk of infection with <i>C. difficile</i>	
Colistin														Y	N	No gram positive or anaerobic cover, renal toxicity high	
Co-trimoxazole														Y	Y		
Gentamicin	\$													Y	N	No strep cover, [§] check MRSA sensitivity, avoid in AKI	
Glycopeptides (vanc, teic)														Y	Y	No gram negative or broad anaerobe cover	
Levofloxacin														N	Y	No anaerobic cover	
Linezolid														N	N	No gram negative or broad anaerobe cover	
Meropenem														Y	Y/N	No MRSA cover or atypical cover.	
Piperacillin/tazobactam														Y	Y		
Temocillin														Y	Y	No gram positive or anaerobic cover, no <i>Pseudomonas</i> cover	
Tigecycline														N	N	Use only on advice of microbiology – not for empiric use in critical illness	

Combinations

Drug \ Organism	Gram Positive							Gram negatives					Notes	
	MRSA	Staph aureus	Coag neg staph	Streps	Ent fecalis	Ent fecium	VRE	Anaerobes	Coliforms	Resp	Pseudomonas	ESBL		Atypicals
Glycopeptides (vanc, teic)	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Red	No gram negative or broad anaerobe cover
PLUS														
Metronidazole	Red	Red	Red	Red	Red	Red	Red	Green	Red	Red	Red	Red	Red	
PLUS ONE from														
Aztreonam	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Yellow	Red	
Ciprofloxacin	Red	Yellow	Yellow	Yellow	Yellow	Red	Red	Red	Green	Green	Green	Yellow	Green	
Gentamicin	§	Green	Green	Red	Green	Green	Red	Red	Green	Green	Green	Red	Red	§ Check MRSA Sensitivity to gentamicin
Levofloxacin	Red	Green	Green	Green	Green	Red	Red	Red	Green	Green	Green	Yellow	Green	
SELECTED OTHER AGENTS														
Chloramphenicol	Green	Green	Green	Green	Green	Yellow	Red	Green	Green	Green	Red	Yellow	Yellow	
Clarithromycin	Red	Green	Red	Green	Red	Red	Red	Red	Green	Green	Red	Red	Green	
Colistin	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Green	Red	Red	
Co-trimoxazole	Green	Green	Green	Yellow	Yellow	Red	Red	Red	Green	Yellow	Red	Red	Red	
Linezolid	Green	Green	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red	Yellow	No gram negative or broad anaerobe cover
Temocillin	Red	Red	Red	Red	Red	Red	Red	Red	Green	Green	Red	Green	Red	No gram positive or anaerobic cover, no Pseudomonas cover
Tigecycline	Green	Green	Green	Green	Green	Green	Green	Yellow	Green	Green	Red	Yellow	Green	
FOR COMPARISON														
Co-amoxiclav	Red	Green	Green	Green	Green	Red	Red	Green	Green	Green	Red	Red	Red	
Meropenem	Red	Green	Green	Green	Green	Red	Red	Green	Green	Green	Green	Green	Red	
Piperacillin/tazobactam	Red	Green	Green	Green	Green	Green	Red	Green	Green	Green	Green	Red	Red	