ADULT SEPSIS / SEPTIC SHOCK INTRAVENOUS ANTIBIOTIC GUIDELINE

Sepsis = Life-threatening organ dysfunction due to abnormal host response to infection

SEPTIC SHOCK = Persistent hypotension with lactate ≥2 mmol/L despite fluid resuscitation

ACTIONS (For ALL Sepsis) 1. Oxygen 2. Lactate 3. Blood cultures 4. IV antibiotics 5. IV fluid resuscitation 6. Monitor vital signs + urine output

For patients with septic shock do not delay antibiotic administration if blood cultures cannot be obtained

Follow the sepsis pathway in conjunction with your local BTF RED & YELLOW Zone escalation procedures.

If source not covered below, patient already on antibiotics, recent travel, or HIGH risk of multi-resistant organism: → call Antimicrobial Stewardship (AMS) hotline via switch

Consider the intraosseous route for administration of antibiotics and fluids if intravenous access cannot be obtained after two failed attempts. Seek early advice from a senior clinician.

Antibiotic regimens below are appropriate for initial EMPIRIC THERAPY in SEPSIS. Reassess after 24h and consider whether dose or frequency require adjustment for RENAL FUNCTION – refer to Therapeutic Guidelines.

Likely source of sepsis or septic shock	Preferred regimen	Non-severe penicillin allergy (NOT anaphylaxis)	Severe penicillin/cephalosporin allergy (e.g. anaphylaxis)
Sepsis of unclear source [Note 1] **OR** **bone/joint infection** **OR** **surgical site infection [Note 2]**	Flucloxacillin 2g 4-hourly **PLUS** gentamicin 4-7mg/kg* IDEAL body weight **PLUS** vancomycin 25-30mg/kg ACTUAL body weight	Cefazolin 2g 6-hourly **PLUS** gentamicin 4-7mg/kg* IDEAL body weight **PLUS** vancomycin 25-30mg/kg ACTUAL body weight	Gentamicin 4-7mg/kg* IDEAL body weight **PLUS** vancomycin 25-30mg/kg ACTUAL body weight
	[Note 1] If *Neisseria meningitidis* infection is suspected, **ADD** ceftriaxone 2g 12-hourly		[Note 1] If *Neisseria meningitidis* infection is suspected, **ADD** ciprofloxacin 400mg 8-hourly
Intravascular access device	Gentamicin 4-7mg/kg* IDEAL body weight **PLUS** vancomycin 25-30mg/kg ACTUAL body weight	Gentamicin 4-7mg/kg* IDEAL body weight **PLUS** vancomycin 25-30mg/kg ACTUAL body weight	Gentamicin 4-7mg/kg* IDEAL body weight **PLUS** vancomycin 25-30mg/kg ACTUAL body weight
Community-acquired pneumonia – high severity (Use SMART-COP to assess severity)	Ceftriaxone 1g 12-hourly **PLUS** azithromycin 500mg daily	Ceftriaxone 1g 12-hourly **PLUS** azithromycin 500mg daily	Moxifloxacin 400mg daily
	If staphylococcal pneumonia is suspected (e.g. rapid progression, cavitation, recent influenza), consider **adding** vancomycin 25-30 mg/kg ACTUAL bodyweight		
Hospital-acquired pneumonia – moderate severity	Ceftriaxone 1g 24-hourly	Ceftriaxone 1g 24-hourly	Moxifloxacin 400mg daily
Hospital-acquired pneumonia - high severity AND/OR increased risk of MRO (e.g. recent HDU / ICU admission, prior infection / colonisation)	Piperacillin-tazobactam 4.5g 6-hourly If risk of MRSA, **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	Cefepime# 2g 8-hourly If risk of MRSA, **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	Ciprofloxacin 400mg 8-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight **OR** (as a single drug) ^Meropenem 1g 8-hourly
Biliary or gastrointestinal source	Gentamicin 4-7mg/kg* IDEAL bodyweight **PLUS** ampicillin 2g 6-hourly	Ceftriaxone 1g 12-hourly **PLUS** metronidazole 500mg 12-hourly	Gentamicin 4-7mg/kg* IDEAL bodyweight **PLUS** clindamycin 600mg 8-hourly

Adapted from Therapeutic Guidelines: Antibiotic, Version 16

	PLUS metronidazole 500mg 12-hourly	For Enterococcal cover (e.g. recurrent infection, recent antibiotics or instrumentation) **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	
Urinary tract source If recent TRUS biopsy, use meropenem 1g 8-hourly and call AMS/ID for advice	Gentamicin 4-7mg/kg* IDEAL bodyweight **PLUS** ampicillin 2g 6-hourly	Gentamicin 4-7mg/kg* IDEAL bodyweight	Gentamicin 4-7mg/kg* IDEAL bodyweight
		For Enterococcal cover (e.g. HAI, previous instrumentation, structurally abnormal urinary tract, recent antibiotics) **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	
Peri- or post-partum sepsis Suspected or proven chorioamnionitis or postpartum endometritis *If an alternate source of sepsis is suspected, refer to the appropriate section of this table*	Ampicillin 2g 6-hourly **PLUS** gentamicin 4-7mg/kg* (pre-pregnancy bodyweight) **PLUS** metronidazole 500mg 12-hourly	Cefazolin 2g 6-hourly **PLUS** gentamicin 4-7mg/kg* (pre-pregnancy bodyweight) **PLUS** metronidazole 500mg 12-hourly	vancomycin 25-30mg/kg ACTUAL bodyweight **PLUS** gentamicin 4-7mg/kg* (pre-pregnancy bodyweight) **PLUS** metronidazole 500mg 12-hourly
	***If patient meets criteria for toxic shock syndrome,* ADD** clindamycin 600mg 8-hourly		
Sepsis with neurological source (organism and/or susceptibility unknown) ****Give dexamethasone 10mg IV before the first dose of antibiotic ****	Ceftriaxone 2g 12-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight If risk of Listeria **ADD** benzylpenicillin 2.4g 4-hourly	Ceftriaxone 2g 12-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight If risk of Listeria, call AMS/ID for advice.	Moxifloxacin 400mg daily **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight If risk of Listeria, call AMS/ID for advice.
Skin infection (cellulitis / erysipelas)	Flucloxacillin 2g 6-hourly If risk of MRSA, **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	Cefazolin 2g 8-hourly If risk of MRSA, **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	Vancomycin 25-30mg/kg ACTUAL body weight
Severe diabetic foot infection **OR** **Infected chronic ulcer (e.g. lower limb or pressure ulcer)**	Piperacillin-tazobactam 4.5g 6-hourly If risk of MRSA, **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	Cefepime# 2g 8-hourly **PLUS** metronidazole 500mg 12-hourly If risk of MRSA, **ADD** vancomycin 25-30mg/kg ACTUAL bodyweight	Ciprofloxacin 400mg 8-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight **PLUS** metronidazole 500mg 12-hourly
Necrotising skin and soft tissue infection (includes Toxic shock)	Meropenem 1g 8-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight **PLUS** clindamycin 600mg 8-hourly	Meropenem 1g 8-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight **PLUS** clindamycin 600mg 8-hourly	^Meropenem 1g 8-hourly **PLUS** vancomycin 25-30mg/kg ACTUAL bodyweight **PLUS** clindamycin 600mg 8-hourly
Febrile neutropenia	Refer to the ISLHD febrile neutropenia and neutropenic sepsis guidelines		

***Choice of dosage should take into consideration the patient's clinical status/comorbidities, potential toxic effects of the drug and the consequence of underdosing.**
^In patients with penicillin hypersensitivity, immune-mediated cross-reactivity with carbapenems is rare; meropenem may be considered in supervised settings. In patients with a history of severe cutaneous adverse reaction (e.g. DRESS, SJS/TEN) consider meropenem only in critical situations when treatment options are limited.
 # Cefepime may accumulate and cause toxicity in patients with reduced renal function – use an appropriate resource (e.g. TG, AMH) to guide dosage adjustment

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TABLE 2: ANTIBIOTIC ADMINISTRATION

- Reconstitute antibiotics with sterile water for injection (WFI) unless stated otherwise.
- If further dilution is required for IV injection or infusion, use sterile sodium chloride 0.9% or sterile glucose 5% unless stated otherwise.
- Where possible use separate dedicated lines for resuscitation fluid and for medications. When injecting antibiotics directly into an IV injection port which has resuscitation fluid running:
  - clamp the infusion fluid line and flush with 20 mL sterile sodium chloride 0.9% solution
  - administer antibiotic over the required time
  - flush the line with 20 mL sterile sodium chloride 0.9% solution and recommence resuscitation fluid.
- For detailed information refer to the SHPA injectable handbook via CIAP:
  http://aidh.hcn.com.au/index.php/section-one/drug-monographs-a-z?view=alphacontent

Antibiotic	Presentation (adult)	Recon fluid /volume	Final volume	Minimum admin time	Notes
Ampicillin	Vial 1g	10 mL WFI	10-20 mL	10-15 min	Penicillin class antibiotic
Azithromycin	Vial 500mg	4.8mL WFI	250mL	60 min	
Benzylpenicillin	Vial 1.2g	10 mL WFI	20mL	5-10 min	Penicillin class antibiotic Doses of > 1.2g should be given by infusion over 30 minutes
Cefazolin	Vial 2g	10 mL WFI	10 mL	5 min	Cephalosporin class antibiotic
Cefepime	Vial 2g	10 mL NS	10 mL	3-5 min	Cephalosporin class antibiotic
Ceftriaxone	Vial 1g	10 mL WFI	10 mL	2-5 min	Incompatible with calcium containing solutions, flush before and after with sodium chloride 0.9 %. **In sepsis, a 2g dose can be injected over 5 minutes.**
Ciprofloxacin	Infusion bag 200mg/100mL	N/A	200mL	60 min	May induce seizures in epileptics
Clindamycin	Vial 600mg/4mL	N/A	50mL	20 min	Do not give as bolus injection
Dexamethasone	Amp 8mg/2mL	N/A	10mL	3 min	Inject slowly over 3 to 5 minutes. May be diluted with 10 mL of sodium chloride 0.9% to facilitate slow injection.
Flucloxacillin	Vial 1g	15 mL WFI	15-20 mL	6-8 min (2 g)	Penicillin class antibiotic **Repeated doses should be further diluted and infused over 30 min**
Gentamicin	Amp 80mg/2mL	N/A	Dependant on dose	3-5 min	Aminoglycoside class antibiotic. Refer to 'special notes' in AIDH for additional information.
Meropenem	Vial 1g	20 mL WFI	20 mL	5 min	
Metronidazole	Infusion bag 500mg/100mL	N/A	100mL	20 min	
Moxifloxacin	Infusion bag 400mg/250mL	N/A	250mL	60 min	May prolong QT interval. May induce seizures in epileptics
Piperacillin-tazobactam	Vial 4g/0.5g	20 mL WFI	20mL	5 min	Penicillin class antibiotic **Repeated doses should be further diluted and infused over 30 min**
Vancomycin	Vial 1g	20 mL WFI	**5mg/mL peripheral	Max 10 mg/min	Infusion related effects are common, decrease infusion rate and monitor closely