EMPIRICAL ANTIBIOTICS FOR IMMUNOCOMPETENT ADULTS WITH SEPSIS

DECEMBER 2019

Guidance on empiric antibiotic therapy in sepsis by infection source:

- Meningitis
- Meningoencephalitis
- Community acquired pneumonia
- Hospital acquired pneumonia
- Urinary sepsis
- Intra-abdominal sepsis
- Cellulitis
- Necrotising fasciitis
- Bites: animal & human
- Sepsis of unknown origin

✓ Always refer to previous microbiology results before prescribing
✓ Check EPR flags and alerts before prescribing
✓ For guidance on penicillin allergy see: CHFT penicillin allergy advice
✓ Obtaining samples is crucial to identifying the causative pathogen & guiding antimicrobial therapy
✓ For patients in septic shock or sources other than those listed below; discuss with on-call microbiologist
✓ Refer to the CHFT summary of MHRA fluoroquinolone advice when prescribing fluoroquinolones
✓ If a fluoroquinolone is recommended but the patient is at high risk of side effects; discuss with on-call microbiologist
✓ Refer to information on linezolid when prescribing this agent.
✓ See BNF for dose adjustment in renal +/- hepatic impairment (contact pharmacist if further advice required)
✓ Contact pharmacy for advice in dosing in extremes of body weight
✓ Where ■ / ♦/ ★/ ∞ symbols appear, refer to specific notes at the end of this document

Indication	Microbiology Samples	Antibiotics	Antibiotics in Penicillin Allergy CHFT penicillin allergy advice	History of MRSA
MENINGITIS ***Discuss HIV+ patients with Microbiology*** ***Refer to full meningitis guideline for information on steroids, sampling & travel related resistance risks.***	**Blood cultures** **CSF** **2x EDTA blood for meningococcal & pneumococcal PCR** **Throat swab for meningococcal culture** **Consider HIV test**	**Ceftriaxone IV 2g 12 hrly** **If ≥60yrs or immunosuppressed (including malignancy, pregnancy, diabetes mellitus or those with history of current alcohol misuse) ADD Amoxicillin IV 2g 4 hrly**	***Mild Allergy (Rash)*** **<60 yrs: Ceftriaxone IV 2g 12 hrly** **≥60 yrs or immunosuppressed (including malignancy, pregnancy, diabetes mellitus or those with history of current alcohol misuse): Meropenem IV 2g 8 hrly** ***Severe Allergy (Anaphylaxis) (if patient is pregnant call microbiology)*** **Chloramphenicol IV 1g 6 hrly** **ADD Co-trimoxazole IV 15-30mg/kg QDS (round to the nearest 480mg to assist nursing staff) if ≥60 yrs or immunosuppressed (including malignancy, diabetes mellitus or those with history of current alcohol misuse).**	**No change**

MENINGO-ENCEPHALITIS	As above. CSF for tests as per meningitis guideline plus viral PCR	As above PLUS Aciclovir IV 10mg/kg 8 hrly	As above PLUS Aciclovir IV 10mg/kg 8 hrly	No change
COMMUNITY ACQUIRED PNEUMONIA *Discuss HIV+ patients with Microbiology* *Clarithromycin increases the long-term mortality risk esp in patients with coronary heart disease but is also associated with lower mortality in those with moderate or high severity CAP. Do not over-treat patients with low severity CAP.* *Do not use clarithromycin or erythromycin if the pt has prolonged QT or is on other QT prolonging medication: discuss with microbiology for an alternative.*	CURB65 score ≤2: Blood Cultures, Sputum C/S, Pneumococcal & Legionella urinary antigen (if clinical/epidemiological risk) (CURB65 score ≥3) In addition to the above: Legionella urinary antigen (in all) + atypical serology. If an atypical pathogen suspected but pt has had symptoms < 14 days: discuss with microbiology. All: Throat swab for respiratory virus PCR testing if features suggestive of influenza infection during influenza season. PHE guidance on antivirals here. Consider HIV test.	non ITU: Benzylpenicillin IV 1.2 g 6 hrly PLUS Clarithromycin IV 500mg 12 hrly add metronidazole 500mg IV 8 hrly if possible aspiration. (if patient is pregnant refer to ■ in notes box at the end of this document). Patients <75 years in ITU: Co-amoxiclav IV 1.2 g 8 hrly PLUS Clarithromycin IV 500mg 12 hrly (if patient is pregnant refer to ■ in the notes box at the end of this document). Patients ≥75 years in ITU: Piperacillin-tazobactam 4.5g IV 8 hrly PLUS Clarithromycin IV 500mg 12 hrly	*Mild Allergy (Rash)* Cefuroxime IV 1.5g 8 hrly PLUS Clarithromycin 500mg 12 hrly add metronidazole 500mg IV 8 hrly if possible aspiration (if patient is pregnant refer to ■ in notes box at the end of this document). *Severe Allergy (Anaphylaxis)* Levofloxacin 500 mg PO/IV 12 hourly (Use PO Levofloxacin if appropriate as it is well absorbed) add metronidazole 500mg IV 8 hrly if possible aspiration	ADD linezolid 600mg PO/IV 12 hourly OR vancomycin IV ♦ if linezolid contra-indicated

HOSPITAL ACQUIRED PNEUMONIA	Blood Cultures, Sputum C/S Throat swab for respiratory virus PCR testing if features suggestive of influenza infection during influenza season	Adults (all age groups) Piperacillin-tazobactam 4.5g IV 8 hrly★	*Mild Allergy (Rash)* Cefuroxime 1.5g IV 8 hrly ★ add metronidazole 500mg IV 8 hrly if possible aspiration *Severe Allergy (Anaphylaxis)* Levofloxacin 500mg PO/IV 12 hourly (Use PO Levofloxacin if appropriate as it is well absorbed) ∞. Also add metronidazole 500mg IV 8 hrly if possible aspiration.	ADD linezolid 600mg PO/IV 12 hourly OR vancomycin IV ♦ if linezolid contra-indicated
URINARY SEPSIS	Do not dip urine in patients >65 years & those with a catheter. Send: Blood cultures MSU/CSU	Patients <75 years: Gentamicin IV ONCE DAILY Hartford regimen See guideline. Dosing is as per EPR powerplan. If <75 years but GFR < 30ml/min or other exclusions to Gentamicin: Cefuroxime 1.5g IV 8 hourly★ Patients ≥75 years: Piperacillin-tazobactam 4.5g IV 8 hourly★	Patients <75 years: Gentamicin IV ONCE DAILY Hartford regimen See guideline Dosing is as per EPR powerplan. Patients ≥75 years or if GFR < 30ml/min or other exclusions to Gentamicin: *If Mild Penicillin Allergy:* Cefuroxime 1.5g IV 8 hourly★ *If Severe Penicillin Allergy:* Ciprofloxacin 500mg PO/400mg IV 12 hourly (Use oral if appropriate as it is well absorbed).	Add vancomycin IV ♦ If using a Gentamicin based regimen contact microbiology before adding vancomycin.
INTRA-ABDOMINAL SEPSIS	Do not dip urine in patients >65 years & those with a catheter. Send: Blood cultures MSU/CSU Theatre samples +/- swabs (as appropriate) Stool (if diarrhoea)	Patients <75 years: Amoxicillin 1g IV 8 hourly PLUS metronidazole 400mg PO/ 500mg IV 8 hourly (use oral if appropriate as it is well absorbed) PLUS Gentamicin IV ONCE DAILY Hartford regimen See guideline. Gentamicin dosing as per EPR powerplan.) If <75 years but GFR < 30ml/min or other exclusions to Gentamicin: Cefuroxime 1.5g IV 8 hourly PLUS metronidazole 400mg	Tigecycline 100mg IV stat, then 50 mg IV 12 hourly. If patient has severe sepsis consider adding: Gentamicin IV ONCE DAILY Hartford regimen See guideline. Dosing is as per EPR powerplan.	Add vancomycin IV ♦ (unless on Tigecycline) If using a Gentamicin based regimen contact microbiology

		PO/ 500mg IV 8 hourly (use oral if appropriate as it is well absorbed).★ Patients ≥75 years: Piperacillin-tazobactam 4.5g IV 8 hrly★		before adding vancomycin.
CELLULITIS *If the patient is severely immunocompromised or has a water-based injury please discuss with a medical microbiologist.* *For diabetic foot infections or surgical site infections see separate "infection specific" guidelines.*	Blood cultures Wound swabs from surgical incisions, abscesses or ulcerated lesions if involved in skin infection. Aspirates of fluid filled lesions	Flucloxacillin IV 2g 6 hrly If IVDU: as above PLUS metronidazole 400mg PO/ 500mg IV 8 hourly (use oral if appropriate as it is well absorbed).	vancomycin IV ♦ OR linezolid 600mg PO/IV 12 hourly If IVDU: as above PLUS metronidazole 400mg PO/ 500mg IV 8 hourly (use oral if appropriate as it is well absorbed).	Vancomycin IV ♦ OR linezolid 600mg PO/IV 12 hourly *instead of* Flucloxacillin
NECROTISING FASCIITIS	As above plus theatre tissue samples	Meropenem IV 1g 8 hrly PLUS Clindamycin IV 1.2g 6 hrly	vancomycin IV ♦ PLUS Ciprofloxacin 500mg PO/400mg IV 12 hrly (use oral if appropriate as it is well absorbed) PLUS Clindamycin IV 1.2g 6 hrly	Add vancomycin IV ♦ (if not included in regimen)
BITES: ANIMAL & HUMAN *These options are only for septic patients/ patients requiring IV treatment.* *For patients requiring PO prophylaxis or PO treatment use the full "infection specific" guideline.*	Blood cultures Wound swabs/ aspirates if appropriate for non- cat or dog animal bites please discuss with microbiology	Patients ≥75 years: Piperacillin-tazobactam 4.5g IV 8 hrly Patients <75 years: Co-amoxiclav 1.2 g IV 8 hrly Consider tetanus, rabies and post-exposure prophylaxis if high risk (see full guideline)	Ciprofloxacin 500mg PO/400mg IV 12 hrly (use oral if appropriate as it is well absorbed) PLUS Clindamycin IV 600mg 6 hrly Consider tetanus, rabies and post-exposure prophylaxis if high risk (see full guideline)	vancomycin IV ♦ OR linezolid 600mg PO/IV 12 hourly IF USING PENICILLIN ALLERGY REGIMEN + HISTORY OF MRSA DISCUSS WITH MICROBIOLOGY

SEPSIS OF UNKNOWN ORIGIN	**Blood cultures x2 sets Paired blood cultures (in central venous access device in situ) MSU/CSU Wound swabs from surgical incisions, abscesses or ulcerated lesions if possible signs of infection Other specimens depending on the clinical presentation**	**Adults (all age groups)** **Piperacillin-tazobactam 4.5g IV 8 hrly★**	**Mild allergy** **Cefuroxime 1.5g IV 8 hrly PLUS metronidazole 400mg PO/ 500mg IV 8 hourly (use oral if appropriate as it is well absorbed)★.** **Severe allergy** **vancomycin IV ♦ PLUS Ciprofloxacin 500mg PO/400mg IV 12 hrly (use oral if appropriate as it is well absorbed) PLUS Metronidazole 500mg IV 8 hrly** **If severe penicillin allergy and history of ESBL please discuss with microbiologist.**	**Add vancomycin IV ♦ (if not included in regimen)**

★ = If history of ESBL, use ERTAPENEM 1g IV OD . Contact microbiology if history of ESBL AND severe penicillin allergy.
♦ = vancomycin doses as per vancomycin guidelines/ EPR powerplan
■ = In pregnancy: refer to BNF re clarithromycin use. Use clarithromycin only when benefit outweighs the risk. If an oral agent is clinically appropriate, use erythromycin 500mg 6 hrly PO in preference to clarithromycin.

∞ = Use only in severe penicillin allergy. As per NICE guideline: "Not licensed for hospital-acquired pneumonia, so use is off-label. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Good practice in prescribing and managing medicines and devices for further information."

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