Empirical Antibiotic Therapy in Adults – Hospital Infection Management

STOP AND THINK BEFORE ANTIBIOTIC THERAPY: 1 in 5 antimicrobial courses is associated with adverse events including C.difficile, drug interactions/ toxicity
IV therapy *must* be reviewed daily and a plan documented including indication and duration. ALWAYS review treatment once microbiology results available.

NHS Forth Valley

Sepsis is a life-threatening condition. THINK SEPSIS if NEWS2 ≥ 5 (Also indicated by Temp < 36°C or > 38°C, HR > 90 bpm, RR> 20/ min & WCC < 4 or > 12 x10^9/L) – Send 2 sets of blood cultures *before* starting antibiotics.

If NEWS2 ≥ 7 Ensure SEPSIS 6 within one hour: 1. Blood cultures (& any other relevant samples) 2. IV Antibiotic administration 3. Oxygen to maintain target saturations 4. Measure lactate 5. IV fluids 6. Monitor urine output hourly.

Lower Respiratory Tract Infection

Infective Exacerbation of COPD
Treatment only if 2 of the following – purulent sputum, increased SOB, increased sputum volume.
Dual antibiotic therapy is not recommended.

Amoxicillin 500mg PO 8 hourly
Or Doxycycline 200mg PO STAT, then 100mg daily

Escalation –
Co-trimoxazole 960mg PO/IV 12 hourly
or
Co-amoxiclav 625mg PO / 1.2g IV 8 hourly

Duration: 5 days

CAP
Assess for sepsis
Calculate CURB65 score:
- Confusion (new onset)
- Urea > 7 mmol/L
- RR ≥ 30 breaths/ min
- BP – diastolic ≤ 60 mmHg or systolic < 90 mmHg
- Age ≥ 65 years

Non-severe:
CURB65 ≤2
Amoxicillin 1g 8 hourly
or
Doxycycline 200mg PO STAT, then 100mg daily
Duration: 5 days

Severe:
CURB65 ≥3
Co-amoxiclav 1.2g IV 8 hourly + Clarithromycin 500mg PO 12 hourly

If true penicillin allergy
Levofloxacin 500mg PO 12 hourly

HAP
Ensure sputum sample is sent. Diagnosis is difficult and is often over diagnosed. Check recent microbiology results.

HAP <5 days since admission
Doxycycline 200mg PO STAT, then 100mg daily

If Severe –
Co-amoxiclav 1.2g IV 8 hourly
If true penicillin allergy - Levofloxacin 500mg PO 12 hourly

HAP ≥ 5 days
Co-trimoxazole 960mg PO 12 hourly

If severe- - Piperacillin/tazobactam 4.5g 8 hourly
If true penicillin allergy - Levofloxacin 500mg PO 12 hourly

Duration: 5 days

Review choice of antibiotic with microbiology results

Aspiration Pneumonia
This is a chemical injury and does not indicate antibiotic treatment.
Reserve antibiotics those who fail to improve within 48 hours post aspiration.
Refer to Aspiration Pneumonia Guidelines: Aspiration Pneumonia

Suspected Viral RTI

Antibiotics should NOT be prescribed unless bacterial co-infection

See hospital Influenza and/or COVID-19 guidelines

Skin/Soft Tissue infections

Mild Cellulitis
Flucloxacillin 500mg PO 6 hourly
OR Doxycycline 200mg PO STAT then 100mg daily
Duration: 5 days

Moderate Cellulitis
Flucloxacillin 1g IV 6 hourly
If true penicillin allergy
Vancomycin IV as per protocol
Durataion: 5-7 days

Severe Cellulitis
Flucloxacillin 2g IV 6 hourly
If true penicillin allergy
Vancomycin IV as per protocol
Duration: 7 days

Necrotising Fasciitis
Seek urgent surgical review
Benzylpenicillin 2.4 g IV 6 hourly
+ Flucloxacillin 2g IV 6 hourly
+ Clindamycin 1.2g IV 6 hourly
+ Metronidazole 500mg IV 8 hourly
+ Gentamicin IV as per protocol

If true penicillin allergy –
Vancomycin IV as per protocol
+ Clindamycin 1.2g IV 6 hourly
+ Metronidazole 500mg IV 8 hourly
+ Gentamicin IV as per protocol

Review antibiotic therapy within 48-72 hours with micro results

Diabetic Foot Infection
Mild:
Flucloxacillin 1g PO 6 hourly

If true penicillin allergy -
Doxycycline 100mg PO 12 hourly

Moderate:
Flucloxacillin 1g PO 6 hourly
(or 2g IV 6 hourly if failed on PO)
+ metronidazole 400mg PO 8 hourly

If true penicillin allergy - Clindamycin 600mg PO 8 hourly

Severe:
Flucloxacillin 2g IV 6 hourly
+ Clindamycin 600mg IV 6 hourly

If true penicillin allergy –
Gentamicin IV as per protocol
+ Vancomycin IV as per protocol
+ Clindamycin 600mg IV 6 hourly

Treatment duration: 7-14 days guided by clinical response
If osteomyelitis suspected/confirmed d/w infection specialist

Gastrointestinal infections

Gastroenteritis/Colitis
Antibiotics not usually indicated
If signs of sepsis /systemic infection treat as per intra-abdominal sepsis

Intra-abdominal sepsis
Gentamicin IV as per protocol
+ Amoxicillin 1g IV 8 hourly
+ Metronidazole 400mg PO 8 hourly

If true penicillin allergy –
Gentamicin IV as per protocol
+ Vancomycin IV as per protocol
+ Metronidazole 400mg PO 8 hourly
Duration: 5-7 days

Spontaneous Bacterial Peritonitis
Piperacillin/Tazobactam 4.5g IV 8 hourly

If true penicillin allergy –
Vancomycin IV as per protocol
+ Ciprofloxacin 400mg IV 12 hourly
+ Metronidazole 500mg IV 8 hourly
Duration: 7 days

Prophylaxis –
Co-trimoxazole, see guidance

C.*Difficile* Infection
New/worsened diarrhoea with C.diff **toxin positive** result
See CDI Guidance

If creatinine not available give Gentamicin as follows

Actual body Weight (kg)	Gentamicin Dose
< 40	5mg/kg
40-49	240mg
50-59	280mg
60-69	320mg
70-79	360mg
≥80	400mg

If CKD 5 give 2.5mg/kg (max 180mg)

See Also Gentamicin Chart

Urinary Tract Infections

UTI in Pregnancy
See NHS FV Obstetric Guidance

Lower UTI (Non-catheterised)
Do not treat asymptomatic bacteriuria.
Obtain urine culture *before* antibiotic.

Trimethoprim 200mg PO 12 hourly
OR Nitrofurantoin 50mg PO 6 hourly
Duration:
Female: 3 days / Male: 7 days
(consider renal function if eGFR <45ml/min, see here)

Complicated UTI (sepsis or pyelonephritis)
Gentamicin IV as per protocol
+ Amoxiclin 1g IV 8 hourly

If true penicillin allergy –
Gentamicin IV as per protocol
+ Vancomycin Iv as per protocol
Duration: 7 days

Catheter Associated UTI
DO NOT treat catheter – related asymptomatic bacteriuria.
If symptoms suggestive of CA-UTI (e.g. lower abdo pain, fever) obtain sensitivity from culture results prior to treatment. Consider catheter change if severe infection/sepsis

Prostatitis
Refer to urology
Ciprofloxacin 500mg PO 12 hourly
Or Doxycycline 100mg PO 12 hourly
Duration: 14 days

Endocarditis

Infective Endocarditis
Native Valve or Prosthetic Valve -
Blood cultures *before* starting antibiotics

Vancomycin IV as per protocol
AND Gentamicin IV as per protocol
(TREATMENT dose)

Discuss with Microbiology or ID within 24 hours of starting antibiotic therapy (BC guide link)

n.b. SYNERGISTIC gentamicin should be used only on the advice of microbiology/infectious diseases consultant

Bone/Joint Infection

Osteomyelitis OR Septic Arthritis
Seek urgent orthopaedic opinion if prosthetic material in-situ

Flucloxacillin 2g IV 6 hourly
AND Gentamicin IV (as per online protocol)

If true penicillin allergy OR known MRSA –
Gentamicin IV as per protocol
+ Vancomycin IV as per protocol

Treatment duration: 4-6 weeks total
Discuss with microbiology with culture results

CNS

Bacterial Meningitis/Encephalitis
Start 9.9mg dexamethasone IV 6 hourly shortly before or alongside antibiotics in strongly suspected meningitis.
Ceftriaxone 2g IV 12 hourly

If >60 years, pregnant, immunosuppressed or alcohol excess – ADD Amoxicillin 2g IV 4 hourly to cover Listeria

If true penicillin allergy –
Meropenem 2g IV 8 hourly

If true anaphylactic reaction to penicillin –
Chloramphenicol 25mg/kg IV 6 hourly (max 8g/day)
+ Co-trimoxazole 1.44g IV 12 hourly to cover *Listeria* if > 60 years old, immunosuppressed or alcohol excess
Duration: discuss with infection specialist

Possible Viral Encephalitis
(confusion/reduced consciousness in suspected CNS infection)
Aciclovir 10mg/kg IV 8 hourly (Use IBW in Obesity)

Ensure CSF Viral PCR is requested

If creatinine not available give vancomycin loading dose

Actual body Weight (kg)	Vancomycin Dose
< 40	750mg
40-59	1000mg
60-90	1500mg
>90	2000mg

See Also Vancomycin chart

Sepsis

Neutropenic Sepsis
Neutrophils <0.5x10^9/L and Fever/Hypothermia
Blood cultures before starting antibiotics
IV antibiotic within 1 hour of admission

SEE FULL GUIDELINE HERE

Sepsis Unknown Origin
Gentamicin IV *
+ Amoxicillin 1g IV 8 hourly
+ Metronidazole 500mg 8 hourly (PO after initial IV dose)
eGFR <20 ml/min - replace Gentamicin with Temocillin IV
- As per High Dose table here

If Staph aureus suspected –
ADD Flucloxacillin 2g IV 6 hourly

If true beta-lactam allergy
IV Vancomycin + IV Gentamicin (dose as per protocol)

eGFR <20 ml/min - replace Gentamicin with Aztreonam IV)

Send blood cultures and other relevant samples.
Check previous microbiology results
Check previous MRSA status

Treatment duration: Guided by source of infection

If treatment failure check microbiology results, seek senior review, discuss with Microbiology

Microbiology Results Guidance
Sensitive: High likelihood of therapeutic success using a standard dosing regimen of the agent.
Sensitive at high dose: High likelihood of therapeutic success when increased dosing is used
Resistant: High likelihood of therapeutic failure even when there is increased exposure.

Oral and IV antibiotic doses are not always equivalent. See individual guideline or ask pharmacy for dosing guidance.

Contacts:
Infectious diseases Consultant (in-hours): 67931
Microbiology Consultant On-call: via switchboard

Author: Y Johnstone, H Madden, E Proud
Updated: April 2025
Review Date: April 2027