Antibiotic ‘rules’ of thumb are broad generalisations which can be used before sensitivity results are available. There are always exceptions & patterns are less predictable now than ever before.

**Practice points**

- Sensitivity testing of the causative organism is important for deep or invasive infections and/or those not responding to treatment. Blood and relevant samples – especially blood cultures where possible – before antibiotic therapy should be taken.
- Check to see if the patient has a previous positive non-AEasy organism like an ESBL, MRSA, CPE, etc. This may influence your initial empiric treatment.
- Therapeutic drug monitoring is required for gentamicin & vancomycin (refer to protocol). Click here to access.

**Before you call MICRObiology for advice please have the following details to hand:**

- Main complaint & history; current & recent antibiotic history.
- Initial assessment & investigations; radiology, samples to determine infection focus.
- Cap; WCC; results & trends.
- Renal function; allergy.
- Observations (SEWs, SIRS, SEPSIS 6, CURB65 etc).

**Rules of ‘thumb’: see note above**

- Gram negative ‘coliforms’ (eg E.coli, Klebsiella, Enterobacter, Proteus) & Pseudomonas aeruginosa are sensitive to gentamicin and most to aztreonam (Amoxicillin only covers 40% of E.coli: when you stop gentamicin you may not have good coliform cover. Check sensitivity). Click here to access.
- Co-trimoxazole covers about 65% of E.coli Excretory Spectrum Beta Lactamase (ESBL) are resistant to all penicillins (including coamoxiclav, piperacillin-tazobactam & aztreonam). Click here to access.
- Temoicillin & (meropenem) have cover for ESBLs. Click here to access.
- Temoicillin does not cover pseudomonas & Pip-tazobactam & (meropenem) have anaerobic cover so metronidazole is not needed.
- Temoicillin & aztreonam have no anaerobic or gram positive cover.
- Carbapenemase producing enterobacteriaceae (CPE) are resistant to penicillins, cephalosporins, piperacillin-tazobactam, aztreonam, temocillin, carbapenems & other classes of antibiotics – gentamicin, ciprofloxacin, co-trimoxazole. Early detection (screening/rim test of those having healthcare from outside Scotland & screening patients from other Scottish hospitals), strict adherence to strict adherence to transmission based infection control precautions & prudent prescribing including of multiresistant pathogens will be in place to reduce impact of spread of these virtually untreatable bacteria.

- All anaerobes are sensitive to metronidazole (and pip-tazobactam & meropenem).
- Gram positives like Staph aurus (MSSA, MRSA), streps & enterococci are sensitive to vancomycin (except VREs): use restricted to penicillin allergy or penicillin resistant strains.
- MRSA is resistant to all beta-lactams (penicillin, flucloxacillin, pip-tazobactam, cephalosporins & meropenem.
- VRE are resistant to vancomycin & meropenem.
- Beta haemolytic streps (groups A B C G) are sensitive to penicillin & flucloxacillin

**CENTRAL NERVIS SYSTEM**

Meningitis refer to protocol, click here to access.

**Meningitis: Pneumococcus & viridans streptococci, enterococci**

- Anaerobic or gram positive cover – vancomycin, metronidazole, ertapenem.
- Resistance is frequent in immuno-compromised patients or multi-drug resistant strains.

**Cardiac**

- Endocarditis refer to protocol, click here to access.

**Haemophilus**

- Haemophilus influenzae infection and inflammas. Legiocoryne may be hospital acquired.

**Proven/likely infection & clinical suspicion**

- Then commence antibiotics & other investigations.

**INTRA-ABDOMINAL INFECTION**

- All anaerobes are sensitive to metronidazole.
- beta-lactams are sensitive to gentamicin and most to aztreonam.
- Only 40% of E.coli are sensitive to amoxillin; when you stop gentamicin you may not have adequate cover. Flucloxacillin are sensitive to amoxicillin.
- 15% of E.coli are sensitive to co-trimoxazole.
- Enterococci are sensitive to co-trimoxazole but testing is required. Nearly always cause infections with coliforms or CPE.
- ESBLs are resistant to all penicillins & cephalosporins including aztreonam, co-amoxicillic & piperacillin-tazobactam. Avoid ESBLs are sensitive to Vancomycin & Meropenem available on infection specialist advice only.
- Sensitivity of ESBLs to co-trimoxazole is unpredictable.

**URINARY TRACT**

- Enterococci (Female: no catheter) co trimoxazole.
- Enterococci (Male: with urinary catheter) co trimoxazole.
- Enterococci (Female: with urinary catheter) co trimoxazole. CIPF for baseline assessment.
- Urinary tract infection is treated as pyelonephritis.

**SKIN & SOFT TISSUE**

- All anaerobes are sensitive to metronidazole.
- beta-lactams are sensitive to gentamicin and most to aztreonam.
- Only 40% of E.coli are sensitive to amoxillin; when you stop gentamicin you may not have adequate cover. Flucloxacillin are sensitive to amoxicillin.
- 15% of E.coli are sensitive to co-trimoxazole.
- Enterococci are sensitive to co-trimoxazole but testing is required. Nearly always cause infections with coliforms or CPE.
- ESBLs are resistant to all penicillins & cephalosporins including aztreonam, co-amoxicillic & piperacillin-tazobactam. Avoid ESBLs are sensitive to Vancomycin & Meropenem available on infection specialist advice only.
- Sensitivity of ESBLs to co-trimoxazole is unpredictable.

**SEPTIC ARTHRITIS/OSTEOMYELITIS**

- All anaerobes are sensitive to metronidazole.
- beta-lactams are sensitive to gentamicin and most to aztreonam.
- Only 40% of E.coli are sensitive to amoxillin; when you stop gentamicin you may not have adequate cover. Flucloxacillin are sensitive to amoxicillin.
- 15% of E.coli are sensitive to co-trimoxazole.
- Enterococci are sensitive to co-trimoxazole but testing is required. Nearly always cause infections with coliforms or CPE.
- ESBLs are resistant to all penicillins & cephalosporins including aztreonam, co-amoxicillic & piperacillin-tazobactam. Avoid ESBLs are sensitive to Vancomycin & Meropenem available on infection specialist advice only.
- Sensitivity of ESBLs to co-trimoxazole is unpredictable.