CLINICAL GUIDELINE

Antibiotic Policy, Obstetric Patients, Treatment

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

Greater Glasgow & Clyde Obstetric Guidelines

Antibiotic Policy for Obstetric Patients **Treatment**

Applicable unit policies

- Caesarean Section
- **Early onset sepsis (neonatal guideline)**
- **Group B streptococcus (obstetric guideline)**
- **PPROM**
- Sepsis - Maternal

Aims

The aim of this policy is to provide broad guidance for the empiric therapy of infections in obstetric patients. It cannot cover all of the possible situations in which infection is a risk or present. Advice on the management/control of infection may be obtained at any time from the duty microbiologist for your site.

Infection control advice may also be obtained from the infection control nurses for your site.

These recommendations are intended to:

* promote the rational, safe and clinically effective use of antibiotics.

* reduce the potential for the emergence of antibiotic resistant bacteria.

* reduce risk of cannula-related infection by promoting oral therapy.

Compliance with these guidelines is an important aspect of the Trust's Infection Control Policy. Please adhere to this policy unless you have discussed the problem with a medical microbiologist.

General Principles

WASH YOUR HANDS BEFORE AND AFTER EACH PATIENT CONTACT.

Wash hands with soap and water. If hands are not visibly soiled, alcohol gel may be effective.

* Take appropriate cultures (e.g. Sputum, MSU, wound swab, blood cultures) prior to starting antibiotics.

* Always take blood cultures prior to starting IV antibiotics.

* Give antibiotics only for as long as required to treat the infection. Insert stop/review dates for all antibiotics.

* Review treatment daily in light of clinical progress and laboratory results.

* Whenever possible use the oral route in order to avoid IV line infections and to reduce cost. The parenteral route should be reserved for patients with serious or severe infections or who cannot tolerate or absorb oral drugs, or where specifically indicated. If the parenteral route is necessary, change to oral as soon as possible.

* Do not treat MRSA colonisation with vancomycin

* Good infection control practice is essential to prevent the spread of antibiotic resistant organisms, e.g. MRSA, Vancomycin Resistant Enterococci, C. difficile, resistant Gram Negative Baccili.

DEFINITION OF SEPSIS – PLEASE RECORD IN CASE NOTES

As labour is different but risks remain note small changes in highlighted parameters that should be considered but err on over diagnosis / response if in doubt.

Sepsis: Clinical symptoms of infection (fever, sweats, chills or rigors, malaise, etc.) as per local MEWS and triggers or proven infection and at least two of the following:

* Temperature <36°C or >38°C

In labour a temperature of ≥ 37.5°C on 2 separate occasions at least 1 hour apart

* Tachycardia HR > 100 bpm or

>110bpm in labour

* Tachypnoea RR > 20 breaths/minute or

>22 breaths/minute in labour

* WCC < 4 or > 16 x 10^9/L

WCC in labour > 20 x 10^9/L (although WCC up to 30 have been observed in labour, a WCC of 20 is the generally recommended threshold for investigation in the literature)

* Altered mental state

Serious or severe sepsis: sepsis with any of the following:

* Organ dysfunction/ hypoperfusion (lactic acidosis, oliguria, or confusion) – *pregnancy results in a relative respiratory alkalosis*

* Hypotension (systolic BP < 90 mmHg or MAP < 65 or a systolic reduction of more than 40 mmHg from baseline)

N.B. Signs of sepsis may be masked in immunosuppression and in the presence of anti-inflammatory drugs or beta blockers. CRP does not reflect the severity of infection and may remain elevated even when infection is resolving; it cannot be used in isolation to assess the severity of infection and hence the need for IV therapy.

Mortality from sepsis and severe sepsis increases with each hour of delay in initiating IV antibiotic therapy. In patients with sepsis, aim to complete the "Sepsis 6" within 1 hour:

** Oxygen therapy (target saturation 94 – 98% or 88 – 92% for those with chronic obstructive pulmonary disease).

** Blood cultures and relevant swabs

** Take Lactate, FBC, CRP U+E, Coagulation, G+S, +/-ABG

** Antibiotics Intravenous (as per local guidelines)

** IV fluids challenge

** Note urine output fluid balance (consider catheterisation in some patients)

Record first dose of antibiotic in the 'one-off' section of the kardex and communicate with the member of staff who is responsible for administration of IV antibiotic therapy to ensure it is administered immediately. Administer the antibiotic in the clinical area where infection has been recognised and do not delay until arrival at the destination ward.

Scenario	Empirical Antibiotics – 1st Line	Empirical Antibiotics – Penicillin allergy	Comments
Group B streptococcus prophylaxis where there is suspected chorioamnionitis or **sustained intrapartum pyrexia (>38.0°C once OR ≥37.5°C twice at least 1 hour apart).** Broad spectrum antibiotics and Group B streptococcus prophylaxis are required.	IV Benzyl penicillin 3g followed by IV Benzyl penicillin 1.8 g 4 hourly AND IV Co-amoxiclav 1.2 g 8 hourly AND IV Gentamicin (Dose per GGC gentamicin dose calculator) Review post-delivery then daily.	IV Clindamycin 900 mg 8 hourly AND IV Gentamicin (Dose per GGC gentamicin dose calculator) Review post-delivery then daily.	**Effective prophylaxis** Always give IAP however soon the lady is likely to deliver. Know that it is more effective the earlier it is started (at least more than 2-4hr before delivery) and if it is continued without interruption until delivery. Prophylaxis is considered to have lapsed if a dose is > 1hr late. If prophylaxis with Benzylpenicillin has lapsed a further loading dose is required.
Suspected Chorioamnionitis or **sustained intrapartum pyrexia (> 38.0°C once OR ≥37.5°C twice at least 1 hour apart).**	IV Co-amoxiclav 1.2 g 8 hourly AND IV Gentamicin. (Dose per GGC gentamicin dose calculator) Review daily.	IV Clindamycin 900 mg infusion 8 hourly AND IV Gentamicin (Dose per GGC gentamicin dose calculator) Review daily.	
Group A streptococcus infection – confirmed	IV Benzyl penicillin 2.4g 6 hourly AND IV Clindamycin 600mg 6 hourly	Vancomycin (see GGC vancomycin dose calculator) AND IV Clindamycin 600mg 6 hourly	Duration 7 -10 days IV or oral. Daily review

Necrotizing fasciitis	IV Clindamycin 600mg 6hourly AND IV Flucloxacillin 2g 4hourly AND IV Benzyl penicillin 2.4g 6hourly AND IV Metronidazole 500mg 8hourly AND IV Gentamicin (See GGC gentamicin dose calculator)	Replace IV Flucloxacillin and IV Benzyl penicillin with IV Vancomycin (see GGC vancomycin dose calculator)	Consider siting 2 cannulas to aid speed of administration of all antibiotics. Seek urgent surgical / orthopaedic review. Urgent DEBRIDEMENT / EXPLORATION may be required.
Severe systemic infection – source unknown	IV Flucloxacillin 2g 6hourly AND IV Gentamicin (See GGC gentamicin dose calculator) AND IV Clindamycin 600mg 6hourly	Replace IV Flucloxacillin with IV Vancomycin (see GGC vancomycin dose calculator)	See definition of sepsis above. Review daily

*gentamicin – dose in accordance with NHS GGC Gentamicin Dosage and Monitoring Guidelines. Care if renal function compromised. All gentamicin prescriptions that continue beyond 3-4 days of treatment must be discussed with microbiology/infectious diseases unit.

Scenario	Empirical Antibiotics – 1st Line	Empirical Antibiotics – Penicillin allergy	Comments
Postnatal Caesarean Section Wound Infection – with no evidence of systemic illness	Oral Flucloxacillin 1 g 6 hourly If anaerobes suspected, ADD Oral Metronidazole 400 mg 8 hourly. **Total course duration 7 days**.	Oral Clarithromycin 500 mg 12 hourly. **Total course duration 7 days.**	Clarithromycin- serious drug interactions (see BNF appendix 1) and QTc prolongation
Postnatal Caesarean Section Wound Infection – systemically unwell	IV Flucloxacillin 1 to 2 g 6 hourly If severe sepsis, consider ADDING *IV Gentamicin (See GGC Gentamicin dose calculator) If anaerobes suspected ADD PR Metronidazole 1 g 8 hourly or IV Metronidazole 500 mg 8 hourly. **Total course duration 10 days (IV/oral).**	IV Clarithromycin 500 mg 12 hourly If severe sepsis, consider ADDING IV Gentamicin (See GGC Gentamicin dose calculator) If anaerobes suspected, ADD PR Metronidazole 1 g 8 hourly or IV Metronidazole 500 mg 8 hourly. **Total course duration 10 days (IV/Oral).**	Clarithromycin- serious drug interactions (see BNF appendix 1) and QTc prolongation
Postnatal Infection – Genital Tract	Oral Co-amoxiclav 625 mg 8 hourly or I V Co-amoxiclav 1.2 g 8 hourly. If patient clinically unwell, consider ADDING IV Gentamicin. (See GGC Gentamicin dose calculator) **Total course duration 5 days (IV/oral)**	Booking weight <70kg Oral Clindamycin 450 mg 8 hourly Booking weight≥ 70kg Oral Clindamycin 600 mg 8 hourly Alternatively if patient unwell IV Clindamycin 900 mg 8 hourly +/- IV Gentamicin. (See GGC Gentamicin dose calculator) **Total course duration (IV/oral) 5 days**.	.

Urinary Tract Infection Antenatal or Postnatal women – Asymptomatic bacteruria	Oral Cefalexin 500 mg 8 hourly OR 1st or 2nd trimester OR Postnatal Oral Nitrofurantoin 50 mg 6 hourly OR OR Postnatal Oral Trimethoprim 200 mg 12 hourly or Oral Co-amoxiclav 375 mg 8 hourly **Total course duration 7 days.**	Oral Cefalexin 500 mg 8 hourly OR 1st or 2nd trimester OR Postnatal Oral Nitrofurantoin 50 mg 6 hourly OR OR Postnatal Oral Trimethoprim 200 mg 12 hourly **Total course duration 7 days.**	Culture prior to treatment and change treatment according to culture results. Treat asymptomatic bacteruria in pregnancy. Re-culture 7 days after completion of course in women who are culture positive. Caution in use of Nitrofurantoin or trimethoprim in renal impairment. See BNF. Trimethoprim BNF state “ Manufacturers advise avoid during pregnancy “
Urinary Tract Infection in antenatal or postnatal women – Lower UTI without sepsis	1st or 2nd trimester Oral Nitrofurantoin 50 mg 6 hourly 3rd trimester Cefalexin 500mg 8hly, if severe penicillin allergy contact microbiology **Total course duration 7 days.** **Postnatal** Oral Nitrofurantoin 50 mg 6 hourly or Oral Trimethoprim 200mg 12 hourly **Total course duration 3 days.**		Culture prior to treatment and change treatment according to culture results. Treat asymptomatic bacteruria in pregnancy. Re-culture 7 days after completion of course. Caution in use of Nitrofurantoin or trimethoprim in renal impairment. See BNF. Trimethoprim BNF state “ Manufacturers advise avoid during pregnancy Refer to BNF for information on the use of antibiotics in pregnancy
Urinary Tract Infection in antenatal or postnatal women – Pyelonephritis without sepsis	Oral Co-amoxiclav 625 mg 8 hourly **Total course duration 7-10 days.**	If mild penicillin allergy, not anaphylaxis Oral Cefalexin 500mg 8 hourly **Total course duration 7-10 days.** Otherwise If inpatient IV gentamicin* maximum duration 4 days, contact microbiology for oral switch **Total course duration 7-10 days**	Culture prior to treatment and review on basis of results. Treat asymptomatic bacteruria in pregnancy. Re-culture 7 days after completion of course. Refer to BNF for information on the use of antibiotics in pregnancy
*gentamicin – dose in accordance with NHS GGC Gentamicin Dosage and Monitoring Guidelines. Care if renal function compromised. All gentamicin prescriptions that continue beyond 3-4 days of treatment must be discussed with microbiology/infectious diseases unit.			

Scenario	Empirical Antibiotics – 1st Line	Empirical Antibiotics – Penicillin allergy	Comments
Urinary Tract Infection in antenatal or postnatal women – Pyelonephritis with sepsis	IV Co-amoxiclav 1.2 g 8 hourly AND IV Gentamicin (See GGC Gentamicin dose calculator) Oral switch co-amoxiclav 625mg 8 hourly **Total course duration (IV/oral) 14 days.**	IV Gentamicin (See GGC Gentamicin dose calculator) Do not continue IV Gentamicin beyond 96 hours. Contact microbiology for oral or alternative IV options within 96 hours of commencing IV gentamicin. **Total course duration (IV/oral) 14 days.**	IV antibiotic administration in sepsis – see note on introduction. **Culture prior to treatment and daily review on basis of results**. Re-culture 7 days after completion of course.
Antenatal or Postnatal Infection – Non Severe community acquired pneumonia (CAP)	Oral Amoxicillin 500 mg 8 hourly OR (dependent on severity) IV Amoxicillin 500 8 hourly. **Total course duration (IV/oral) 7 days**.	Oral Clarithromycin 500 mg 12 hourly OR (dependent on severity) Clarithromycin 500 mg IV every 12 hours. **Total course duration (IV/oral) 7 days.**	Clarithromycin- serious drug interactions (see BNF appendix 1) and QTc prolongation
Antenatal or Postnatal Infection - Severe community acquired pneumonia (CAP) or CAP PLUS sepsis syndrome	IV/ Oral Clarithromycin 500 mg 12 hourly AND Either IV Amoxicillin 1 g 8 hourly OR IV Co-amoxiclav 1.2g 8 hourly. **Total Course duration (IV and oral): if rapid clinical improvement by day 3, then 5 days of treatment otherwise 7-10 days (as per response). Confirmed legionella 10-14 days**	IV/ Oral Clarithromycin 500 mg 12 hourly AND Vancomycin (See GGC Vancomycin dosing guidelines) **Total Course duration (IV and oral): if rapid clinical improvement by day 3, then 5 days of treatment otherwise 7-10 days (as per response). Confirmed legionella 10-14 days**	Clarithromycin- serious drug interactions (see BNF appendix 1) and QTc prolongation
CAP (See above) PLUS Staphyloccoccal pneumonia suspected e.g. complicating influenza	Add to CAP schedule IV Flucloxacillin 2 g 6 hourly. **Total course duration 14-21 days**	IV/ Oral Clarithromycin 500 mg 12 hourly AND IV Vancomycin. (See GGC Vancomycin dosing guidelines) **Total course duration 14-21 days.**	Clarithromycin- serious drug interactions (see BNF appendix 1) and QTc prolongation
Mastitis	IV Flucloxacillin 1-2 g 6 hourly Or (dependent on severity) Oral Flucloxacillin 1 g 6 hourly. **Total course duration 5 days.**	IV Clarithromycin 500 mg 12 hourly Or (dependent on severity) Oral Clarithromycin 500 mg 12 hourly. **Total course duration 5 days**	Clarithromycin- serious drug interactions (see BNF appendix 1) and QTc prolongation

Post-partum endometritis (no fever/not unwell)	Oral Co-amoxiclav 625mg 8 hourly **Total Course Duration 5days** AND Oral Azithromycin 1 g once **only**.	PR Metronidazole 1 g **once only** AND Oral Azithromycin 1g **once only**.	If already received azithromycin post-abortion **do not** redose
Post-partum endometritis (with fever/unwell)	IV Clindamycin 900mg 8hourly AND IV Gentamicin (See GGC gentamicin dosing guidelines) IVOST Co- amoxiclav 625 mg oral every 8 hours. **Total course duration (IV/oral) 7 days**. AND Azithromycin 1 g oral once only.	IV Clindamycin 900 mg 8 hourly AND IV Gentamicin (See GGC Gentamicin dosing calculator) Oral Clindamycin <70 kg booking weight 450 mg 8 hourly ≥ 70 kg booking weight 600 mg 8 hourly AND Oral ciprofloxacin 500 mg 12 hourly. **Total course duration (IV/oral) 7 days.** AND Azithromycin 1 g oral once only.	If already received azithromycin post-abortion **do not** redose
*gentamicin – dose in accordance with NHS GGC Gentamicin Dosage and Monitoring Guidelines. Care if renal function compromised. All gentamicin prescriptions that continue beyond 3-4 days of treatment must be discussed with microbiology/infectious diseases unit.			

Endocarditis Prophylaxis for Obstetric Procedures www.nice.org.uk/CG064 recommends that antibiotic prophylaxis is NO LONGER offered routinely for defined interventional procedures of the genito-urinary tract (including urological, gynaecological, and obstetric procedures). Any infection in women at risk of endocarditis should be investigated promptly and treated appropriately to reduce the risk of endocarditis developing.

Women at risk of endocarditis should be:
* Advised to maintain good oral hygiene
* Told to recognise signs of infective endocarditis, and advised when to seek expert advice
Regard women with the following conditions as being at particular risk of developing infective endocarditis:
* Acquired valvular heart disease with stenosis or regurgitation
* Valve replacement
* Structural congenital heart disease, including surgically corrected or palliated structural conditions but excluding isolated atrial septal defect, fully repaired ventricular septal defect, or fully repaired patent ductus arteriosis, and closure devices that are judged to be endothelialised.
* Hypertrophic cardiomyopathy

* Previous infective endocarditis
* Intravenous drug misusers

Cover is suggested for patients with prosthetic valves or patients who have had a previous attack of endocarditis. If patients also require cover for Group B Strep. both sets of antibiotics need to be administered.

* For patients not allergic to penicillin and who have not had penicillin more than once in the previous month: Amoxicillin 1 g iv with gentamicin 160 mg iv at the time of induction of anaesthesia or 15 minutes before the surgical procedure. (If needed, repeat both every 12 hours until delivered). Six hours following delivery, give one further dose of amoxicillin 500 mg orally.
* For patients allergic to penicillin or who have had penicillin more than once in the previous month: Teicoplanin 400 mg iv with gentamicin 160 mg iv at the time of induction of anaesthesia or 15 minutes before the surgical procedure (repeat both every 12 hours until delivered). No dose required after procedure.

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GENITO –URINARY INFECTIONS	Refer to Sandyford for other STI testing/ contact tracing for all STI's
Syphilis	Consult with microbiologist and Sandyford re appropriate therapy on an individual basis.
Gonococcus	Consult with microbiologist and Sandyford re appropriate therapy on an individual basis.
Uncomplicated Genital Chlamydia Both woman and partner offered prescription from hospital if appropriate to do so.	Woman Oral: Azithromycin 1g immediately then 500mg OD on days 2 and 3. Partner Oral: Azithromycin 1g immediately then 500mg OD on days 2 and 3. OR Doxycycline 100 mg every 12 hours for 7 days (Contraindicated in pregnancy)
Bacterial vaginosis	Oral: Metronidazole 400 mg every 12 hours for 5 days. If oral not tolerated, Vaginal gel 0.75%: Contents of one applicator into the vagina at night for 5 nights.
Trichomonal vaginosis Both woman and partner offered prescription from hospital if appropriate to do so.	Oral: Metronidazole 400 mg every 8 hours for 5 days for both patient and partner. If oral not tolerated by patient, Vaginal gel 0.75%: Contents of one applicator into the vagina at night for 5 nights.

APPENDIX 1.

Teicoplanin Dose Banding for GBS Prophylaxis

Most recent weight	Dose (mg)
Less than 36kg	400mg
36 - 45.9 kg	500mg
46 - 53.9 kg	600mg
54 - 61.9 kg	700mg
62kg or above	800mg

References/ resources

www.nice.org.uk/CG190 Intrapartum care for healthy women and babies December 2014. Updated February 2017
www.nice.org.uk/CG064 Prophylaxis against infective endocarditis. March 2008 Last updated July 2016.
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