D&G Obstetrics and Gynaecology Formulary

NHS Dumfries & Galloway

Aims

The aim of this policy is to provide guidance for the empiric therapy of infections in obstetric patients. It cannot however 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. Infection control advice may also be obtained from the infection control nurses.

Important notes

The antibiotics and doses recommended on this poster apply to women aged ≥ 16 years and where normal hepatic & renal, and delivery of a healthy, full term infant is assumed.
Consult the BNF/BNFC before prescribing for women aged < 16 years or renal drug database for dosing in renal impairment where relevant. Seek advice if necessary.
IV antibiotics are only required for patients who are severely ill, unable to tolerate oral treatment, or when oral therapy would not provide adequate coverage/tissue penetration.
If the infection is not obstetric-related, and the woman is post-natal and not breastfeeding, refer to the "Empirical Antibiotic Guidelines for Secondary Care (Adults)".
This document should not be used to guide therapy if the organism is known and microbiology susceptibility results are available.
If patient is pregnant you must state this on any microbiology request.

Vancomycin Refer to the **standard D&G Adult Vancomycin Guideline**. Use booking weight for calculating the dose.
Gentamicin guideline for obstetric and gynaecology is currently under review. However, when dosing use booking weight for calculating the dose. Ensure senior review within 24 hours of starting.

Indication	Empirical First Line	Second Line/ Penicillin Allergy	Duration	Additional notes
URINARY TRACT				
Lower urinary tract infection	**First and second trimester:** Nitrofurantoin (immediate release) 50mg qds **Third trimester:** *Cefalexin 500mg 12 hourly **Post-natal:** Nitrofurantoin (immediate release) 50mg qds	**First and second trimester:** *Cefalexin 500mg 12 hourly (For severe allergy- contact micro) **Third trimester (<36wks gestation):** Nitrofurantoin (immediate release) 50mg qds **Third trimester (≥ 36wks gestation and during labour):** Contact microbiology **Post-natal:** Trimethoprim 200mg 12 hourly	**Pregnancy:** 7 days **Post-natal:** 3 days	**Pregnancy:** Culture prior to treatment and, if required, change according to culture results. Repeat culture 7 days after completing treatment to confirm clearance of infection. *Cefalexin is suitable for mild penicillin allergy only. Nitrofurantoin, in the short term unlikely to cause problems to foetus. However, avoid at term (i.e. from 36 weeks onwards) as may produce neonatal haemolysis. Nitrofurantoin is contraindicated in eGFR<45mls/min.

Authors: Dr Jon Van Aartsen (Consultant Microbiologist), Dr Catriona Barlow (Consultant Obstetrician & Gynaecologist)
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Asymptomatic bacteriuria	**Start treatment once <u>microbiology culture results known</u>** Nitrofurantoin (immediate release) 50mg qds (if ≥36wks gestation onwards- contact micro for advice) or Amoxicillin 500mg 8 hourly or *Cefalexin 500mg 12 hourly Treat asymptomatic bacteriuria in pregnancy. Culture prior to treatment, and choose the narrowest spectrum antibiotic based on susceptibility results, renal function and allergies. Repeat culture 7 days after completing treatment to confirm clearance of infection.		7 days	Trimethoprim is no longer licensed in pregnancy. Being a folate antagonist, it has a theoretical risk in the first trimester, but is considered safe in 2nd and 3rd trimesters; if used, does not necessarily need discussion with microbiology, but be aware of risk/benefit and discussion with patient. **<u>However,</u>** trimethoprim should be avoided in all trimesters for those with established folate deficiency, low dietary folate intake, or taking other folate antagonists. Caution in renal impairment.
Pyelonephritis (without sepsis)	*Cefalexin 1gram 8 hourly	**Mild penicillin allergy:** *Cefalexin 1gram 8 hourly **Severe penicillin allergy:** Discuss with microbiology	7-10 days	
Pyelonephritis (sepsis)	IV piperacillin/tazobactam 4.5 gram 8 hourly +/- IV gentamicin stat dose (if severe sepsis) PO Switch: *cefalexin 1 gram 8 hourly	**Mild penicillin allergy**: IV cefuroxime 1.5 gram 8 hourly +/- IV gentamicin stat dose (if severe sepsis) **Severe penicillin allergy:** IV gentamicin **PO Switch (mild penicillin allergy):** *Cefalexin 1 gram 8 hourly **PO switch (severe penicillin allergy):** Discuss with Microbiology	10-14 days	**Gentamicin:** If IV gentamicin beyond 72 hours. If alternative IV/PO option is required, discuss with Microbiology

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Indication	Empirical First Line	Second Line/ Penicillin Allergy	Duration	Additional notes
SKIN				
Caesarean section wound infection	**If oral antibiotics appropriate:** Flucloxacillin 1 gram 6 hourly **Anaerobes suspected:** Metronidazole 400mg 8 hourly **If IV antibiotics required:** IV flucloxacillin 2 grams 6 hourly If sepsis, consider adding: IV gentamicin **Anaerobes suspected:** add IV/PO metronidazole 500mg/400mg 8 hourly	**If oral antibiotics appropriate** Clarithromycin 500mg 12 hourly **Anaerobes suspected:** Metronidazole 400mg 8 hourly **If IV antibiotics required:** IV clarithromycin 500mg 12 hourly If sepsis, consider adding: IV gentamicin **Anaerobes suspected:** add IV/PO metronidazole 500mg/400mg 8 hourly **If MRSA positive:** IV vancomycin **If sepsis, consider adding:** IV gentamicin **Anaerobes suspected:** add IV/PO metronidazole 500mg/400mg 8 hourly **PO switch or if PO antibiotics required:** discuss with Microbiology	7-10 days	Wound infection is a clinical diagnosis- do not swab wounds to diagnose infection. Adjust antibiotics according to swab results if there is no clinical improvement on empirical therapy. **Clarithromycin:** serious drug interactions (see BNF appendix1) and QTc prolongation. **Gentamicin:** Do not continue IV gentamicin beyond 72 hours. If alternative IV/PO option required, discuss with Microbiology.
Mastitis	**If oral antibiotics appropriate:** Flucloxacillin 1 gram 6 hourly **If IV antibiotics required:** IV Flucloxacillin 2 grams 6 hourly **If symptoms fail to settle after 48 hours:** PO/IV co-amoxiclav 625mg/ 1.2 gram 8 hourly	**If oral antibiotics appropriate:** Clarithromycin 500mg 12 hourly **If known MRSA:** Co-trimoxazole[#] 960mg 12 hourly **If IV antibiotics required or MRSA positive:** IV vancomycin **If symptoms fail to settle after 48 hours:** Discuss with microbiology	7-14 days	[#]Avoid co-trimoxazole during pregnancy and whilst breastfeeding in the first 6 weeks after birth, where there is a possibility of G6PD deficiency, or if baby is jaundiced. Discuss with microbiology as needed.

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Indication	Empirical First Line	Second Line/ Penicillin Allergy	Duration	Additional notes
RESPIRATORY TRACT				
Community acquired pneumonia (CURB65 score =<2 and no sepsis	PO amoxicillin 500mg 8 hourly	PO clarithromycin 500mg 12 hourly	5 days	**Clarithromycin:** serious drug interactions (see BNF appendix1) and QTc prolongation.
Community acquired pneumonia (CURB65 score >=3 or any CURB65 with sepsis)	IV co-amoxiclav 1.2 grams 8 hourly + PO clarithromycin 500mg 12 hourly **PO switch:** Co-amoxiclav 625mg 8 hourly + PO clarithromycin 500mg 12 hourly	**Mild penicillin allergy:** IV ceftriaxone 2 grams 24 hourly + PO clarithromycin 500mg 12 hourly **PO switch:** clarithromycin 500mg 12 hourly **Severe penicillin allergy:** IV vancomycin + PO clarithromycin 500mg 12 hourly **PO switch:** discuss with Microbiology	5 - 7 days (5 days if rapid response by 72 hours)	

Indication	Empirical First Line	Second Line/ Penicillin Allergy	Duration	Additional notes
GENITAL SYSTEM				
Post-natal genital tract infection (e.g. episiotomy wound infection)	PO co-amoxiclav 625mg 8 hourly	**Mild penicillin allergy:** *PO cefalexin 1 gram 8 hourly + PO metronidazole 400mg 8 hourly **Severe penicillin allergy:** PO clarithromycin 500mg 12 hourly + PO metronidazole 400mg 8 hourly	5 days	*Cefalexin is suitable for mild penicillin allergy only.

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<table>
<tr>
<td>Endometritis without sepsis [post-partum / post-termination of pregnancy (TOP)]</td>
<td>PO co-amoxiclav 625mg 8 hourly</td>
<td>Mild penicillin allergy:
*PO cefalexin 1 gram 8 hourly + PO metronidazole 400mg 8 hourly

Severe penicillin allergy:
PO **clindamycin 450-600mg PO 8 hourly + PO ciprofloxacin 500mg PO 12 hourly</td>
<td>7 days</td>
<td rowspan="2">*Cefalexin/ Cefuroxime is suitable for mild penicillin allergy only

Check chlamydia status and treat if positive.

**Booking weight:
<70 kg = clindamycin 450mg 8 hourly
>70kg = clindamycin 600mg 8 hourly

If postpartum and breast feeding with Clindamycin: Clindamycin reported to appear in human milk. Monitor the infant for possible effects on gastrointestinal flora such as diarrhoea, candidiasis (thrush, nappy rash) or rarely, blood in stool (could indicate possible antibiotic associated colitis).

Ciprofloxacin: Ciprofloxacin can cause problems in the joints of juvenile animals exposed to it. The relevance to breastfeeding is unknown, and short maternal courses are unlikely to pose problems. Avoid breastfeeding 3-4 hours after a ciprofloxacin dose to decrease exposure to infant. Baby should be watched for symptoms such as diarrhoea and yeast infection (thrush or diaper rash) if breastfeeding.</td>
</tr>
<tr>
<td>Endometritis with sepsis (post-partum / post-Termination of pregnancy (TOP)</td>
<td>IV co-amoxiclav 1.2 gram 8 hourly + IV gentamicin

PO switch: co-amoxiclav 625mg 8 hourly</td>
<td>Mild penicillin allergy:
*IV cefuroxime 1.5 gram 8 hourly + IV metronidazole 500mg 8 hourly+ IV gentamicin stat dose (if severe sepsis)

PO switch: *cefalexin 1 gram 8 hourly + metronidazole 400mg 8 hourly

Severe allergy:
IV vancomycin + IV gentamicin + IV metronidazole 500mg 8 hourly

PO switch: **clindamycin 450-600mg 8 hourly + Ciprofloxacin 500mg 12 hourly</td>
<td>7 days</td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td colspan="3">Non-pregnant / pregnant / breastfeeding:

PO metronidazole 400mg 12 hourly for 7 days
or
Intravaginal metronidazole 0.75% gel 5 grams 24 hourly for 5 days
or
Intravaginal clindamycin 2% cream 5 grams applicatorful at night (24 hourly) for 7 days (caution in first trimester)</td>
<td>Single dose of PO metronidazole 2g can be considered if not pregnant/breastfeeding and compliance is a concern.

Breastfeeding with Metronidazole: Breast feeding can continue if given - does not appear to pose any difficulty in lactation. Published evidence shows metronidazole passes into breast milk in moderate amounts, but the drug and its active metabolite have relatively short half-lives, therefore drug accumulation in the breastfed infant is unlikely.</td>
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</table>

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Vaginal candidiasis	**Non-pregnant:** Intravaginal clotrimazole 500mg pessary, single dose or PO fluconazole 150mg, single dose Consider adding topical 1% clotrimazole + 1% hydrocortisone cream if severe inflammatory component **Pregnant / breastfeeding:** Intravaginal clotrimazole 500mg pessary at night, for up to 7 nights Consider adding topical 1% clotrimazole + 1% hydrocortisone cream if severe inflammatory component	All topical and oral azoles give 75% cure. In pregnancy avoid oral azoles and use longer courses of intravaginal treatment.
Other genital infections / sexually transmitted infections	Liaise with sexual health team and refer to the West of Scotland Sexual Health Network Clinical Guidelines: www.wossexualhealthmcn.scot.nhs.uk	

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MATERNAL (ANTENATAL AND POST-NATAL) SEPSIS OF UNKNOWN SOURCE				
Sepsis (evidence of infection with inflammatory response)	IV co-amoxiclav 1.2 gram 8 hourly + IV gentamicin **PO switch:** co-amoxiclav 625mg 8 hourly	**Mild penicillin allergy:** *IV cefuroxime 1.5 gram 8 hourly + IV metronidazole 500mg 8 hourly + IV gentamicin stat dose (if severe sepsis) **PO switch:** *cefalexin 1 gram 8 hourly + metronidazole 400mg 8 hourly **Severe penicillin allergy:** IV vancomycin + IV gentamicin + IV metronidazole 500mg 8 hourly **PO switch:** discuss with Microbiology		*Cefalexin/ Cefuroxime is suitable for mild penicillin allergy only
Septic shock	IV piperacillin/tazobactam 4.5 gram 6 hourly + IV gentamicin + IV clindamycin 1.2 gram 6 hourly **PO switch:** co-amoxiclav 625mg 8 hourly	**Mild penicillin allergy:** *IV cefuroxime 1.5 gram 6 hourly + IV gentamicin + IV clindamycin 1.2 gram 6 hourly **PO switch:** *cefalexin 1 gram 8 hourly + metronidazole 400mg 8 hourly **Severe penicillin allergy:** IV vancomycin + IV gentamicin + IV clindamycin 1.2 gram 6 hourly **PO switch:** discuss with Microbiology		*Cefalexin/ Cefuroxime is suitable for mild penicillin allergy only

Indication	Empirical First Line	Second Line/ Penicillin Allergy	Duration	Additional notes
INTRA-PARTUM INFECTIONS AND PROPHYLAXIS (NON-PROCEDURAL)				
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 gram 8 hourly + IV gentamicin PO switch: co-amoxiclav 625mg 8 hourly **Group B streptococcus prophylaxis required (e.g. confirmed GBS carrier):** Add IV benzylpenicillin 3g STAT followed by 1.8g 4 hourly	**Mild penicillin allergy:** *IV cefuroxime 1.5 gram 8 hourly + IV metronidazole 500mg 8 hourly PO switch: *cefalexin 1 gram 8 hourly + metronidazole 400mg 8 hourly **Severe penicillin allergy:** IV vancomycin + IV gentamicin + IV metronidazole 500mg 8 hourly PO switch: discuss with Microbiology **Group B streptococcus prophylaxis required (e.g. confirmed GBS carrier):** No additional agents required	REVIEW after delivery. If no further pyrexia AND mother is clinically well, 48 hours (IV+PO) of antibiotics should be given post-natally. If inflammatory markers are normal, consider stopping If source identified, rationalise antibiotics based on culture results and/or source, as per formulary	*Cefalexin/ Cefuroxime is suitable for mild penicillin allergy only Always give intra-partum prophylaxis however soon the patient is likely to deliver. It is more effective the earlier it is started (at least > 2-4 hours before delivery) and if continued without interruption until delivery. For benzylpenicillin given > 1 hour late a further loading dose of 3g is required.
Pre-term pre-labour rupture of membranes	PO erythromycin oral 250mg 6 hourly		10 days	Prophylaxis only required if no evidence of chorioamnionitis.
Group B Streptococcus prophylaxis	IV benzylpenicillin 3 gram STAT, then 1.8 gram every 4 hours	**Mild penicillin allergy:** *IV cefuroxime 1.5 gram STAT, then 750mg every 8 hours **Severe penicillin allergy:** IV vancomycin 1gram bd until delivery (as per RCOG guideline)	Until delivery	*Cefuroxime is suitable for mild penicillin allergy only Always give intra-partum prophylaxis however soon the patient is likely to deliver. It is more effective the earlier it is started (at least > 2-4 hours before delivery) and if continued without interruption until delivery. For benzylpenicillin given > 1 hour late a further loading dose of 3g is required.

3rd degree tear	Refer to NHS-DG "Clinical Guideline for Surgical and Procedural Antibiotic Prophylaxis in Adults"	Prophylaxis only	
4th degree tear	Refer to NHS-DG "Clinical Guideline for Surgical and Procedural Antibiotic Prophylaxis in Adults"	5 days	

ANTIBIOTIC PROPHYLAXIS IN OBSTETRIC AND GYNAECOLOGICAL PROCEDURES

All antibiotics should be single dose unless surgery prolonged i.e. >4 hours post-first dose antibiotic or ≥1500ml blood loss/ obstetric haemorrhage

Please refer to the full obstetrics/gynaecology surgical prophylaxis guideline: NHS-DG Clinical Guideline for Surgical and Procedural Antibiotic Prophylaxis in Adults

High BMI Dosing:
Pregnant: use booking weight
Non-pregnant: use current weight

Dosing will need to be increased if:
* >80kg for clindamycin, metronidazole
* >100kg for co-amoxiclav

	>100kg	
Co-amoxiclav	Add 1g IV amoxicillin to 1.2g IV co-amoxiclav	
	>80kg	**>160kg**
Clindamycin	900mg o	1200mg
Metronidazole	1000mg	1500mg

Dose/ interval specific see **“Recommendations for Re-Dosing in Surgical Prophylaxis”** section of the NHS-DG "Clinical Guideline for Surgical and Procedural Antibiotic Prophylaxis in Adults

References:

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2. Schaefer C et. al. Drugs during Pregnancy and Lactation- treatment option and risk assessment. 3rd Edition. https://rudiapt.wordpress.com/wp-content/uploads/2017/11/drugs-during-pregnancy-and-lactation-3rd-ed-2015.pdf
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4. Safety in Breastfeeding. Specialist Pharmacy Service https://www.sps.nhs.uk/page/2/?s=ciprofloxacin&order=DESC&cat%5B0%5D=3008
5. Prevention of Early-onset Group B Streptococcal Disease (Green-top Guideline No. 36) https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/prevention-of-early-onset-group-b-streptococcal-disease-green-top-guideline-no-36/
6. NHS Grampian, NHS GGC, NHS Lanarkshire, NHS Tayside’s Obstetric and Gynaecology Antimicrobial Formulary