NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINE

Guideline for Antibiotic Use in the Canniesburn Unit, both prophylaxis and 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.

Guideline for antibiotic use in the Canniesburn Unit, Both prophylaxis and treatment

Canniesburn Unit and Antimicrobial Utilisation Committee Feb 2019
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Contents

Introduction

Antibiotic resistance has become a major issue and the World Economic Forum has placed it alongside terrorism and climate change on its global risk register. Prudent use of antimicrobials is therefore essential with limitation of antimicrobials to those where there are clear symptoms or suspicion of infection. Prudent antimicrobial use is also important in surgical prophylaxis where post-operative antibiotics should only be given to treat active/ongoing infection unless specifically recommended against the surgical procedure. This guideline aims to provide antibiotic use recommendations for the Canniesburn Unit clinical teams.

The guideline is divided in 3 sections. The first section 'Antibiotic surgical prophylaxis (for Theatres)' includes advice on surgical antibiotic prophylaxis for the operating theatre team. The second section 'Antibiotic prophylaxis (for Wards)' includes advice on specific indications where antibiotic prophylaxis at ward level is considered appropriate (e.g. trauma, post-operative prophylaxis). The third section 'Empirical antibiotic treatment regimens' includes advice on the treatment of infections (e.g. skin and soft tissue, bites, post-operative infections).

The guideline also suggests antibiotic treatment course lengths. Documentation of antibiotic course length on the Drug Kardex is important to prevent unnecessary continuation of therapy. Please record antibiotic course length. A helpful acronym to remember good antibiotic prescribing practice is 'SPARED' which stands for samples, policy, allergies, reason, end/review date and daily review is described in the table below. Also, discuss complicated or severe infections with microbiology.

Please let us know if there are sections that you think could be improved or up-dated in view of new evidence. We welcome your thoughts and comments to: michael.dasilvaneto@ggc.scot.nhs.uk Telephone: 0141 211 0588.

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SPARED: Good antibiotic prescribing practice

Samples	• Send samples for culture, sampling pre-antibiotics whenever possible. • Check the culture results & review therapy when you have them. Can you NARROW THE SPECTRUM?
Policy	• Comply with local policies (see StaffNet, posters & app) for antibiotic CHOICE, ROUTE & DURATION. • Check for drug interactions & cautions (e.g. clarithromycin, rifampicin). • Complete Protected Antibiotic Forms. • Discuss complex or difficult cases with microbiology/ID.
Allergies	• Check & document the patient's allergy status before prescribing. • Document & consider the nature of any 'allergies'. • A blank allergy status DOES NOT = NKDA.

Reason	• Record the indication when starting any antibiotic.
	• Document other reasoning, for example:
	  ▪ Rationale for any policy deviation
	  ▪ Details of any microbiology/ID discussion

End date	• Document the intended duration (add to medicine kardex with a STOP LINE). • Check the empiric antibiotic policy/IVOST policy for recommended durations.
Daily review	• Monitor & document patient response. • Check culture results & narrow the spectrum if possible. • Review the need for IV therapy DAILY (refer to IVOST; see the poster & app). Document a formal review of IV within 72h with the outcome (e.g. stop, IVOST, continue IV with reason). • Observe indicated duration & stop if an alternative non-infectious diagnosis is made. • Avoid prolonged (>4 days) gentamicin courses.

1 Antibiotic surgical prophylaxis in Plastic surgery (for Theatres)

NHS Greater Glasgow and Clyde recommendations for antibiotic surgical prophylaxis in Plastic surgery in Adults: Canniesburn Unit

<u>Single dose, IV prophylaxis</u> ≤ 60mins prior to skin incision/ intervention.

- Post-op antibiotics should only be given to treat active/ongoing infection unless specifically recommended against the surgical procedure.
- For gentamicin dose please see Appendix 1.
- If >1.5 L blood loss, replace fluid and repeat antibiotic dose: clindamycin (half the original dose), co-amoxiclav (same dose), flucloxacillin (same dose), clarithromycin (same dose), metronidazole (same dose), gentamicin (half the original dose), and teicoplanin (half the original dose if blood loss occurs within one hour of the first dose).
- If surgery >4 hrs repeat flucloxacillin, clindamycin and co-amoxiclav; >8 hrs repeat flucloxacillin, clindamycin, co-amoxiclav, clarithromycin, metronidazole, and if eGFR > 60 mL/min/1.73m^2 gentamicin (full prophylactic dose). No repeat dosing of teicoplanin if surgery prolonged.
- MRSA: decolonise prior to procedure as per NHS GGC infection control guidelines and discuss with microbiology regarding antibiotic choice.
- For those patients who have been identified as CPE (carbapenemase producing enterobacteriaceae) carriers, contact microbiology for advice.
- Because of the scope of plastic surgery this list is not comprehensive but offers a guideline for prescribing in similar types of operation.

Note: teicoplanin and gentamicin are incompatible when mixed directly, therefore always flush between administration (with sodium chloride 0.9% or glucose 5%).

Procedure	Recommended Antibiotic	Penicillin Allergy
Superficial elective surgery to any non-contaminated site Surgery for minor clean trauma wounds	Not recommended	Not recommended
Excision of ulcerated lesion (squamous cell/basal cell carcinoma)	If positive swab results from Clinic/Pre assessment or concerns of infection discuss with microbiology regarding antibiotic choice	

Breast surgery Note: There is no evidence to support continued prophylaxis after wound closure and whilst surgical drains are in place. Post op antibiotics should only be given to treat active/ongoing infection.	IV Co-amoxiclav 1.2 g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg Plus IV Gentamicin (prophylactic dose)
Nipple reconstruction	Not recommended	Not recommended
Abdominoplasty	IV Co-amoxiclav 1.2 g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg Plus IV Gentamicin (prophylactic dose)
Open fractures (lower/upper limb) 1. At presentation Antibiotics within 3 hrs of injury. Continue antibiotics until first debridement (excision). 2. At the time of first debridement Continue antibiotics until soft tissue closure or for a maximum of 72 hrs whichever is sooner. 3. At surgery for skeletal stabilisation and definitive tissue closure Single dose only – do not continue post surgery.	IV Co-amoxiclav 1.2 g 8 hourly IV Co-amoxiclav 1.2 g IV Co-amoxiclav 1.2 g	IV Clindamycin 600 mg 6 hourly If grossly contaminated add IV Gentamicin (dose as per **treatment** guidelines – dosing info here) IV Clindamycin 600 mg IV Clindamycin 600 mg

<u>Hand surgery</u> Elective • Surgery without implant (clean)	Not recommended	Not recommended
• Surgery involving insertion of implant/ percutaneous K-wires Trauma • Clean	IV Flucloxacillin 1 g Not recommended	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg Not recommended
• Requiring wires/fixation (closed fractures/ligament injuries)	IV Flucloxacillin 1 g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg
• Contaminated/dirty/open fractures Antibiotics within 3 hrs of injury. Continue antibiotics until first debridement. Following debridement continue for max duration 72 hrs (or stop when soft tissue closure whichever is sooner).	IV Co-amoxiclav 1.2 g 8 hourly	IV Clindamycin 600 mg 6 hourly if grossly contaminated add IV Gentamicin (dose as per **treatment** guidelines – dosing info here)
Contaminated/dirty lacerations Antibiotics within 3 hrs of injury. Continue antibiotics until first debridement. Following debridement continue for max duration 72 hrs (or stop when soft tissue closure, whichever is sooner).	IV Co-amoxiclav 1.2 g 8 hourly	IV Clindamycin 600 mg 6 hourly if grossly contaminated add IV Gentamicin (dose as per **treatment** guidelines – dosing info here)
Surgery in the femoral triangle Groin dissection Sentinel node biopsy Hidradenitis (groin) (If positive swab results from Clinic/Pre assessment discuss with microbiology regarding antibiotic choice)	IV Co-amoxiclav 1.2g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg + IV Gentamicin (prophylactic dose) + IV Metronidazole 500mg

Axilla dissection Sentinel node biopsy Hidradenitis (axilla) (If positive swab results from Clinic/Pre assessment discuss with microbiology regarding antibiotic choice)	IV Flucloxacillin 1g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg
Vulval surgery Gynae / perineal procedures including those with mesh placement	IV Co-amoxiclav 1.2g	IV Clindamycin 600mg + IV Gentamicin (prophylactic dose)
Head and neck surgery (clean, benign, sentinel node biopsy)	Not recommended	Not recommended
Head and neck (contaminated/clean-contaminated; clean, malignant, neck dissection)	IV Co-amoxiclav 1.2g	IV Clarithromycin 500mg + IV Metronidazole 500mg
Nasal surgery requiring an osteotomy	IV Co-amoxiclav 1.2g	IV Clarithromycin 500mg + IV Metronidazole 500mg
Facial surgery (clean)	Not recommended	Not recommended
Facial plastic surgery with implant	IV Flucloxacillin 1g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg
Extensive facial surgery	IV Flucloxacillin 1g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg
• Surgery involving nasal/oral cavities	IV Co-amoxiclav 1.2g	IV Clarithromycin 500mg + IV Metronidazole 500mg

Major malignant bone resection requiring reconstruction with flaps Excision of soft tissue sarcoma requiring reconstruction with flaps	IV Co-amoxiclav 1.2g + IV Gentamicin (prophylactic dose) Post op IV Co-amoxiclav 1.2 g 8 hourly (for 2 doses only) then switch to oral co-amoxiclav 625 mg 8 hourly until drain is removed	IV Clindamycin 600 mg + IV Gentamicin (prophylactic dose) Post op IV Clindamycin 600 mg 6 hourly (for 2 doses only) then switch to oral clindamycin 600 mg 8 hourly + oral ciprofloxacin 500 mg 12 hourly until drain is removed
	If drain duration over 7 days discuss with microbiology regarding antibiotic duration	
Acute burn surgery	IV Flucloxacillin 1 g	≤ 40 Kg IV Teicoplanin 400mg > 40 Kg IV Teicoplanin 800mg
Late burn reconstruction	Review culture results and discuss antibiotic choice with microbiology	

Appendix 1 Gentamicin Surgical Prophylaxis Dosing Guidelines

Prophylactic gentamicin dosing is based on patient height and approximates to 3mg/kg/ideal body weight, capped at 300mg. This allows bolus administration in anaesthetic room.

Avoid gentamicin if eGFR<20mls/min/1.73m^2: seek advice on alternative from microbiology **In renal transplant patients avoid gentamicin and seek advice from microbiology or renal team**			
Height ranges **(Feet and Inches)**	**Height ranges** **(cm)**	**Gentamicin Dose (mg)**	
		Males	**Females**
4' 8" - 4' 10"	142 - 147	**160**	**140**
4' 11" - 5' 3"	148 - 160	**180**	**160**
5' 4" - 5' 10"	161 - 178	**240**	**200**
5' 11" - 6' 2"	179 - 188	**300**	**260**
≥6' 3"	≥189	**300**	**300**

2 Antibiotic prophylaxis in Plastic surgery (for Wards)

- Post-op antibiotics should only be given to treat active/ongoing infection unless specifically recommended in the section below
- If tetanus prone wound refer to A&E tetanus protocol
- Record antibiotic duration on Drug Kardex

Indication	Recommended antibiotic	Penicillin allergy
Open fractures (lower/upper limb) Antibiotics should be given as soon as possible after the injury	IV Co-amoxiclav 1.2 g 8 hrly	IV Clindamycin 600 mg 6 hrly If grossly contaminated add IV Gentamicin (dose as per **treatment** guidelines – dosing info here)
	Duration continue antibiotics until soft tissue closure or for a maximum of 72 hrs whichever is sooner	
Hand trauma • Clean	Not recommended	Not recommended
• Dirty/open fractures Antibiotics should be given as soon as possible after the injury	IV Co-amoxiclav 1.2 g 8 hrly	IV Clindamycin 600 mg 6 hrly if grossly contaminated add IV Gentamicin (dose as per **treatment** guidelines – dosing info here)
	Duration continue antibiotics until soft tissue closure or for a maximum of 72 hrs, whichever is sooner	
Contaminated/dirty lacerations Antibiotics should be given as soon as possible after the injury	IV Co-amoxiclav 1.2 g 8 hrly	IV Clindamycin 600 mg 6 hrly if grossly contaminated add IV Gentamicin (dose as per **treatment** guidelines – dosing info here)
	Duration continue antibiotics until soft tissue closure or for a maximum of 72 hrs, whichever is sooner	

<table>
<tr><td rowspan="2">Major malignant bone resection requiring reconstruction with flaps

Excision of soft tissue sarcoma requiring reconstruction with flaps</td><td>Post op
IV Co-amoxiclav 1.2 g 8 hrly (for 2 doses only) then switch to oral co-amoxiclav 625 mg 8 hrly until drain is removed</td><td>Post op
IV Clindamycin 600 mg 6 hrly (for 2 doses only) then switch to oral Clindamycin 600 mg 8 hrly + oral
Ciprofloxacin▪* 500 mg 12 hrly until drain is removed</td></tr>
<tr><td colspan="2">If drain duration over 7 days discuss with microbiology regarding antibiotic duration</td></tr>
<tr><td rowspan="2">Human or animal bite prophylaxis

If no signs of infection, only give antibiotic prophylaxis in the following situations:
• Immunosupressed (including asplenia, liver disease, diabetes, rheumatoid arthritis)
• Patients with prosthetic joints, heart valves
• Post mastectomy
• Wound in areas of underlying venous and/or lymphatic compromise
• Wound on the hand, wrist, foot, face, genitalia or close to a joint
• Crush wound with devitalised tissue
• Previously sutured wounds
• Full thickness wounds involving tendons, ligaments and joints
• Delayed presentation, >6 hours (antibiotics not required if wound is >2 days old and no sign of local or systemic infection)
• Pre-existent or resultant oedema of the affected area
• Moderate to severe bite (clear full thickness skin puncture or tissue loss)
• Cat bites</td><td>Co-amoxiclav oral 625 mg 8 hrly</td><td>Doxycycline* oral 100mg 12 hrly
+ Metronidazole oral 400mg 8 hrly</td></tr>
<tr><td colspan="2">Antibiotics should be given as soon as possible after the injury

Duration 3 days</td></tr>
<tr><td>Use of leeches</td><td colspan="2">Ciprofloxacin▪* oral 500 mg 12hrly

Duration continue 24 hours after leeches removed</td></tr>
</table>

▪Ciprofloxacin: risk of serious drug interactions and may prolong the QTc interval. Avoid if other QTc risk factors. See BNF (appendix 1) or seek advice from pharmacy.

*Doxycycline/Ciprofloxacin: absorption reduced with oral iron, calcium, magnesium and some nutritional supplements. See BNF (appendix 1) or seek advice from pharmacy.

3 Empirical antibiotic treatment regimens in Plastic surgery

NHS Greater Glasgow and Clyde, Canniesburn Plastic Surgery and Burns Unit recommendations for empirical antibiotic therapy in adults

- **Assess severity of infection. Document in patient's notes presence of:**
- **Systemic Inflammatory Response Syndrome (SIRS) score (indicates severe infection if SIRS ≥ 2).**
- **Whenever possible, collect all culture specimens prior to administration of antibiotics. Review therapy as per culture results.**
- **Post-op antibiotics should only be given to treat active/ongoing infection unless specifically recommended in the antibiotic prophylaxis section of this guideline.**
- **Record antibiotic duration on Drug Kardex.**

Indication	Antibiotic therapy	Penicillin allergy
Mild soft tissue infection	Oral Flucloxacillin 1g 6 hrly	Oral Doxycycline* 100 mg 12 hrly
	Duration 5 days	
Moderate cellulitis/erysipelas Consider OPAT/ambulatory care	IV Flucloxacillin 2 g 6 hrly	IV Vancomycin (dosing info here) also if MRSA suspected
	Duration 7 days (IV/oral)	
Suspected necrotising fasciitis or any rapidly spreading or life or limb threatening infection Seek urgent surgical/orthopaedic review, urgent debridement/exploration may be required (discuss with microbiology)	IV Flucloxacillin 2 g 4 hrly + IV Benzylpenicillin 2.4 g 6 hrly + IV Metronidazole 500 mg 8 hrly + IV Clindamycin 600 mg 6 hrly + IV Gentamicin (dose as per **treatment** guidelines – dosing info here)	IV Vancomycin (dosing info here) + IV Metronidazole 500 mg 8 hrly + IV Clindamycin 600 mg 6 hrly + IV Gentamicin (dose as per **treatment** guidelines – dosing info here)
	Duration 10 – 14 days or as per microbiology/ID	

▪Ciprofloxacin: risk of serious drug interactions and may prolong the QTc interval. Avoid if other QTc risk factors. See BNF (appendix 1) or seek advice from pharmacy.

*Doxycycline/Ciprofloxacin: absorption reduced with oral iron, calcium, magnesium and some nutritional supplements. See BNF (appendix 1) or seek advice from pharmacy.

<table>
<tr><td rowspan="2">Mild infected human or animal bite

(if no signs of infection please refer to antibiotic prophylaxis section)</td><td>Co-amoxiclav oral 625 mg 8 hrly</td><td>Doxycycline* oral 100 mg 12 hrly
+ Metronidazole oral 400 mg 8 hrly</td></tr>
<tr><td colspan="2">Duration 7 days
Duration if no signs of infection 3 days</td></tr>
<tr><td rowspan="2">Severe infected human or animal bite (discuss with microbiology)

(if no signs of infection please refer to antibiotic prophylaxis section)</td><td>Co-amoxiclav IV 1.2 g 8 hrly</td><td>Metronidazole oral 400 mg 8 hrly
+ Ciprofloxacin▪* oral 500 mg 12 hrly
+ Vancomycin IV (dosing info here)</td></tr>
<tr><td colspan="2">Duration 10 days (IV/oral)
Duration if no signs of infection 3 days</td></tr>
<tr><td rowspan="5">Post-operative infection

Treat empirically as per anatomical source and review cultures. Discuss antibiotic choice with microbiology.
• Mild
• Severe (discuss with microbiology)
• Involving groin/gynae/major head and neck/general surgery
o Mild
o Severe (discuss with microbiology)</td><td>Oral Flucloxacillin 1g 6 hrly</td><td>Oral Doxycycline* 100 mg 12 hrly</td></tr>
<tr><td>IV Flucloxacillin 2 g 6 hrly</td><td>IV Vancomycin (dosing info here)</td></tr>
<tr><td>Oral Co-amoxiclav 625 mg 8 hrly</td><td>Oral Ciprofloxacin▪* 500 mg 12 hrly + oral Clindamycin 600 mg 8 hrly</td></tr>
<tr><td>IV Co-amoxiclav 1.2 g 8 hrly if more severe infection</td><td>IV Vancomycin (dosing info here) + IV Gentamicin (dose as per treatment guidelines – dosing info here) + IV Metronidazole 500 mg 8 hrly</td></tr>
<tr><td colspan="2">Duration 7 days (IV/oral) but dependent on clinical review</td></tr>
</table>

▪Ciprofloxacin: risk of serious drug interactions and may prolong the QTc interval. Avoid if other QTc risk factors. See BNF (appendix 1) or seek advice from pharmacy.

*Doxycycline/Ciprofloxacin: absorption reduced with oral iron, calcium, magnesium and some nutritional supplements. See BNF (appendix 1) or seek advice from pharmacy.