



## CLINICAL GUIDELINE

# Antibiotic Prophylaxis in Neurosurgery in Adults

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.

<b>Version Number:</b>	8
<b>Does this version include changes to clinical advice:</b>	Yes
<b>Date Approved:</b>	19 <sup>th</sup> August 2021
<b>Date of Next Review:</b>	31 <sup>st</sup> August 2024
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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.

## NHS Greater Glasgow and Clyde recommendations for antibiotic prophylaxis in Neurosurgery in Adults

**Single dose, IV prophylaxis** ≤ 60 minutes prior to skin incision / intervention.

### Gentamicin♦

- See appendix 1 for prophylactic dosing
- Doses of up to 400mg gentamicin can be given by slow IV injection over 3 – 5 minutes.
- If subsequent treatment using gentamicin is required, measure gentamicin concentration 6-14 hours post theatre gentamicin dose, and follow GGC guidance on staffnet for gentamicin dosing. Calculate the gentamicin dose using the online calculator. Discuss with pharmacy if further advice is required (or if out of hours, the on call pharmacist).
- Teicoplanin and gentamicin are incompatible when mixed directly and must not be mixed before injection.

**If >1.5L blood loss** replace fluid and repeat antibiotic dose: cefuroxime, co-amoxiclav, flucloxacillin, metronidazole (all at full prophylactic dose). Give half the original teicoplanin dose if ≥ 1.5L blood loss within the first hour of the operation. Once bleeding is controlled, measure gentamicin concentration. If the gentamicin concentration is < 2.0mg/L re-dose with half the original gentamicin dose.

**If surgery >4hrs** repeat cefuroxime, co-amoxiclav, flucloxacillin; **>8hrs repeat** cefuroxime, co-amoxiclav, flucloxacillin, metronidazole. No repeat dosing of teicoplanin if surgery prolonged. **If surgery is expected to continue for > 8hours from first gentamicin dose**, measure the gentamicin concentration at 6 hours. If the gentamicin concentration is < 2.0 mg/L re-dose with half the original gentamicin dose.

### **If surgery continues for > 8hours from first antibiotic dose and > 1.5L blood loss**

- Once bleeding is controlled, measure the gentamicin concentration. If the gentamicin concentration is < 2.0mg/L re-dose with half the original gentamicin dose.

**If MRSA:** decolonise prior to procedure as per NHS GGC infection control guidelines and discuss with microbiology regarding antibiotic choice.

**CPE carriers:** If identified as Carbapenemase producing Enterobacteriaceae carriers contact microbiology

**Teicoplanin\*** if ≤ 40Kg, then teicoplanin 400mg. Give teicoplanin by slow IV injection over 3-5 minutes. Teicoplanin and gentamicin are incompatible when mixed directly, therefore always flush between administrations.

### Weight based dosing

Consider increasing the dose of the following antibiotics as below:

	Weight >80 Kg	Weight >160 Kg
Cefuroxime	3 g	
Metronidazole	1000 mg	1500 mg
	<b>Weight &gt; 100 Kg</b>	
Co-amoxiclav	Add 1 g IV amoxicillin to 1.2 g Co-amoxiclav	

Procedure	Antibiotic (Single dose IV unless stated otherwise)
<b>Craniotomy</b>	<b>Cefuroxime</b> IV 1.5 g Or <i>If true penicillin/ beta-lactam allergy or MRSA suspected/known</i> <b>Teicoplanin*</b> IV 800mg AND <b>Gentamicin♦</b> NB Teicoplanin and gentamicin are incompatible when mixed directly, therefore always flush between administrations.
<b>Clean contaminated</b> (Procedures that breach air sinuses, mastoid air cells or nasal or oral cavity – guidelines as per ENT antibiotic prophylaxis)	<b>Co-amoxiclav</b> IV 1.2 g Or <i>If true penicillin/ beta-lactam allergy or MRSA suspected/known</i> <b>Teicoplanin*</b> IV 800mg AND <b>Metronidazole</b> IV 500 mg
<b>CSF shunt</b>	<b>Flucloxacillin</b> IV 2 g Or <i>If true penicillin/ beta-lactam allergy or MRSA suspected/known</i> <b>Teicoplanin*</b> IV 800mg
<b>Spinal surgery</b>	<b>Flucloxacillin</b> IV 2 g Or <b>Cefuroxime</b> IV 1.5 g Or <i>If true penicillin/ beta-lactam allergy/ MRSA suspected/proven</i> <b>Teicoplanin*</b> IV 800mg
<b>DBS Electrode implantation</b> <b>After first CT brain, prior to Craniotomy</b>	<b>Gentamicin♦ IV</b> AND <b>Teicoplanin*</b> IV 800mg NB Teicoplanin and gentamicin are incompatible when mixed directly, therefore always flush between administrations.
<b>Change of Implanted Pulse Generator (IPG)/ battery replacement</b>	<b>Gentamicin♦ IV</b> AND <b>Teicoplanin*</b> IV 800mg NB Teicoplanin and gentamicin are incompatible when mixed directly, therefore always flush between administrations.

Appendix 1 Gentamicin♦ Surgical Prophylaxis Dosing Guidelines

- **Prophylactic gentamicin dosing** is based on patient height and approximates to 5mg/kg/ideal body weight, capped at 400mg.
- Doses of gentamicin can be given by slow IV injection over 3-5 minutes.
- Patients receiving aminoglycosides as a slow IV bolus should be closely monitored for other signs of extravasation or infiltration e.g. swelling, redness, coolness or blanching at the cannula insertion site.
- Avoid gentamicin if eGFR <20mls/min/1.73m<sup>2</sup>: seek advice on alternative from microbiology. In renal transplant patients avoid gentamicin and seek advice from microbiology or renal team.

Height ranges (cm)	Gentamicin Dose (mg)	
	Males	Females
142 – 146	240	200
147 – 154	280	240
155 – 164	320	280
165 – 174	360	320
≥175	400	400