



CLINICAL GUIDELINE

Antibiotic prophylaxis in paediatric cardiothoracic Surgery

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.

Royal Hospital for Children Glasgow - Antibiotic Prophylaxis for Paediatric Cardiothoracic Surgery

General Principles for prescribing:

- Administer the dose of pre-operative IV antibiotic prophylaxis within the 60 minutes prior to skin incision/intervention.
- Administer antibiotic doses intravenously and NOT into the cardiac bypass circuit or arterial line.
- To reduce the risk of post-operative drug errors, prescribe antibiotics on the 'Once Only' section of the drug Kardex and also on the anaesthetic record.
- Seek Microbiology or ID opinion for patients on existing antimicrobial therapy or with complex microbiological problems.
- Follow RHC Glasgow monographs or [Medusa monograph](#) for drug reconstitution and administration.
- For patients with a history of teicoplanin resistant coagulase negative staphylococcus please discuss with Microbiology
- Ongoing use of antibiotics for delayed chest closures is not warranted, except at time of exploration/closure as outlined below

Procedure	Antibiotic	Pre-operative Dose	Intra-operative Doses	Post-operative Doses
Cardiac Surgery All procedures except for those detailed below.	Cefuroxime	NEONATE		
		50mg/kg	Age 1-6 days: 50mg/kg 12 hourly Age 7-28 days: 50mg/kg 8 hourly In severe blood loss, (~>25ml/kg) give a further dose after fluid replacement and bleeding stabilised.	<u>Age 1-6 days:</u> 50mg/kg 12 hourly for a further 2 doses. Give the first dose 12 hours after the last theatre dose. <u>Age 7-28 days:</u> 50mg/kg 8 hourly for a further 2 doses. Give the first dose 8 hours after the last theatre dose. For subsequent exploratory procedure OR chest closure doses should be given pre and post procedure as follows: <u>Age 1-6 days:</u> 50mg/kg 30mins prior to procedure, and 12 hours post procedure <u>Age 7-28 days:</u> 50mg/kg 30mins prior to procedure and 8 hours post procedure Prophylaxis for chest exploration/chest closure is only required if it is longer than 3 hours since the last administered cefuroxime dose.
		CHILD 1 MONTH-16 YEARS		
		50mg/kg (max 1.5g)	50mg/kg (max 1.5g) every 4 hours In severe blood loss (~>25ml/kg or >1500ml) give a further dose after fluid replacement and bleeding stabilised.	50mg/kg (max 1.5g) 8 hourly for a further 2 doses. Give the first dose 8 hours after last theatre dose. For subsequent exploratory procedure OR chest closure doses should be given pre and post procedure as follows: 50mg/kg (Max 1.5g) 30mins prior to procedure and 8 hours post procedure Prophylaxis for chest exploration/chest closure is only required if it is longer than 3 hours since the last administered cefuroxime dose.
	If TRUE Penicillin Allergy or MRSA: Teicoplanin + Gentamicin	See dosing regimen below		
Cardiac Surgery ONLY insertion of pacemakers, prosthetic heart valves, annuloplasty rings or interposition grafts in the Left Heart (systemic circulation) OR In TRUE penicillin allergy This includes Aortic Root Replacement, with or without associated valve replacement.	Teicoplanin + Gentamicin Check if patient has had any doses of gentamicin prior to surgery. Teicoplanin MUST be given as an IV infusion over 30 mins in neonates OR As a slow IV bolus over AT LEAST 5 mins in infants and children >2months.	NEONATE & INFANTS LESS THAN 2 MONTHS		
		Teicoplanin 16mg/kg Gentamicin 5mg/kg	Not required	Teicoplanin: One dose of 8mg/kg 24 hours after the pre-operative dose Gentamicin: Not required Teicoplanin and gentamicin should NOT be re-dosed for exploratory procedures OR chest closure UNLESS >24 hours since the last dose was given. If >24 hours since the last dose, give: Teicoplanin: 16mg/kg STAT. Gentamicin: Check pre dose 'trough' 22-24 hours after the theatre dose. When the level is LESS THAN 1mg/L, re-dose with 5mg/kg. For continuing gentamicin therapy, re-check level every 2-3 days or sooner if renal function deteriorates. For further advice on monitoring and dose adjustment contact Pharmacy.

		CHILD 2 MONTHS -16 YEARS		
	Vancomycin is used as an alternative to Teicoplanin ONLY if the patient is already established on treatment. Vancomycin should NOT be initiated immediately prior to or during surgery. See notes below on vancomycin use & monitoring.			
		Teicoplanin: 10mg/kg (max 800mg)	Not required	Teicoplanin: 10mg/kg (max 800mg) 12 hourly for a further 2 doses Give the first dose 12 hours after the pre-operative dose. Gentamicin: Not required Teicoplanin and gentamicin should NOT be re-dosed for exploratory procedures OR chest closure UNLESS >24 hours since the last dose was given. If >24 hours since the last dose, give: Teicoplanin: 10mg/kg (max 800mg), repeated after 12 hours. Gentamicin: Check pre dose 'trough' 22-24 hours after the theatre dose. When the level is LESS THAN 1mg/L, re-dose with 7mg/kg (max 400mg). For continuing gentamicin therapy, re-check level every 2-3 days or sooner if renal function deteriorates. For further advice on monitoring and dose adjustment contact Pharmacy
		Gentamicin: 7mg/kg (max 400mg)		

Vancomycin prescribing and monitoring notes:

Vancomycin is used as an alternative to Teicoplanin ONLY if the patient is already established on treatment. Vancomycin should NOT be initiated immediately prior to or during surgery. Patients may either be receiving vancomycin as a 'Continuous intravenous infusion' or as an 'intermittent IV infusion'. For the purposes of clarity, the latter will be referred to as an 'Intermittent dosing regimen'.

Caution is required in patients on concomitant nephrotoxic drugs (e.g gentamicin, loop diuretics, captopril, NSAIDs) and in patients who are severely fluid restricted. Frequent monitoring of renal function and daily vancomycin levels are recommended. For further advice please contact Pharmacy.

Continuous IV infusion:

- Continuous vancomycin infusions should continue whilst the patient is in theatre.
- A 'steady state' plasma concentration of 15-25mg/L should be sought prior to incision.
- Levels should be re-checked 12-24 hours post-surgery or sooner if renal function is deteriorating.
- Contact Pharmacy for further advice.

Intermittent dosing regimen:

- Complete vancomycin dose at least one hour prior to surgery. Please liaise with Consultant Anaesthetist re timing
- If no break in treatment
 - Check a vancomycin 'trough' level 12-24 hours post-surgery, immediately prior to a scheduled dose
 - Give the next scheduled dose - do not wait for the level unless there are concerns about renal function
- Single vancomycin dose missed during surgery
 - Administer the dose as soon as possible after surgery.
 - Check a trough level 24 hours after re-starting the dosing regimen, or sooner if the renal function is deteriorating.
- If multiple vancomycin doses have been missed during surgery contact Pharmacy for further advice.
- For intermittent dosing regimens, aim for a trough (Cmin) level of 10-20mg/L, based on clinical response.