



MONOGRAPH	
Amoxicillin (Amoxycillin) / Clavulanic Acid Monograph - Paediatric	
Scope (Staff):	Clinical Staff – Medical, Nursing, Pharmacy
Scope (Area):	Perth Children's Hospital (PCH)

This document should be read in conjunction with this [DISCLAIMER](#)

DESCRIPTION	<ul style="list-style-type: none"> Amoxicillin is a penicillin antibiotic which interferes with cell wall synthesis by binding to penicillin-binding proteins resulting in cell lysis.⁽¹⁻⁴⁾ Clavulanic acid is a beta-lactamase inhibitor, it extends the spectrum of activity of amoxicillin against many beta-lactamase producing organisms such as some strains of <i>Staphylococcus aureus</i> and <i>Haemophilus influenzae</i>.⁽²⁾
INDICATIONS AND RESTRICTIONS	<p>Oral: Unrestricted (Green) antibiotic</p> <ul style="list-style-type: none"> This is not a restricted agent. Follow standard ChAMP guidelines where appropriate. <p>IV: Monitored (orange) antibiotic</p> <ul style="list-style-type: none"> If the use is consistent with a standard approved indication, this must be communicated to ChAMP by documenting that indication on all prescriptions (inpatient and outpatient). The ChAMP team will review if ongoing therapy is required and/or if the order does not meet ChAMP Standard Indications. If use is not for a standard approved indication, phone approval must be obtained from ChAMP before prescribing.
CONTRAINDICATIONS	<ul style="list-style-type: none"> Amoxicillin is generally contraindicated in patients with a history of high risk allergy to penicillins. History of cholestatic jaundice or hepatic dysfunction with amoxicillin/clavulanate potassium therapy.⁽⁴⁾
PRECAUTIONS	<ul style="list-style-type: none"> Amoxicillin may be prescribed in selected patients with high risk allergy to another Beta-lactam sub-class (e.g. some cephalosporins, carbapenems) in discussion with immunology.^(2, 4) In patients with a previous low risk reaction to amoxicillin or another penicillin (delayed rash [>1 hr after initial exposure] without mucosal or systemic involvement) the risk of

	<p>subsequent reaction is low. Re-challenge may be acceptable in discussion with immunology.</p> <ul style="list-style-type: none"> Amoxicillin with clavulanic acid is associated with a higher incidence of rash when used in patients with infectious mononucleosis, acute lymphoblastic leukaemia, chronic lymphocytic leukaemia and HIV infection.⁽²⁾
<p>FORMULATIONS</p>	<p>Available at PCH:</p> <p>Tablet:</p> <ul style="list-style-type: none"> Duo Forte[®] - amoxicillin 875mg with clavulanic acid 125mg. <p>Suspension:</p> <ul style="list-style-type: none"> Duo 400[®] - amoxicillin 400mg with clavulanic acid 57mg per 5mL oral powder for suspension. <p>Intravenous:</p> <ul style="list-style-type: none"> Amoxiclav Juno[®] - amoxicillin 1000mg with clavulanic acid 200mg per vial. <p>Other formulations:</p> <p>Tablet:</p> <ul style="list-style-type: none"> Duo[®] - amoxicillin 500mg with clavulanic acid 125mg tablets <p>Suspension:</p> <ul style="list-style-type: none"> amoxicillin 125mg with clavulanic acid 31.25mg per 5mL oral powder for suspension.
<p>DOSAGE</p>	<ul style="list-style-type: none"> The doses listed below fall within the standard range. Higher doses may be prescribed for certain situations in consultation with an infectious diseases or clinical microbiology consultant. All doses are expressed and should be prescribed as the amoxicillin component (doses refer to the Duo 400[®] and Duo Forte[®] preparations). <p>Neonates (less than 30 days of age):</p> <p>Please refer to neonatal clinical care drug protocols for oral dosing. For IV dosing please consult an Infectious Diseases or Clinical Microbiology consultant.</p> <p>IV: Change to oral route when possible</p> <ul style="list-style-type: none"> Birth (term) to 3 months and <4kg: IV infusion 25mg/kg every 12 hours Birth (term) to 3 months and >4kg: IV infusion 25mg/kg every 8 hours 3 months and <40kg: IV 25mg/kg (maximum 1g) every 8 hours; increase to every 6 hours in severe infections. >40kg: IV 1g every 8 hours; increase to every 6 hours in severe infections. Up to 2g every 6-8 hours can be used.⁽²⁾

	<p>Oral (>1 month to 18 years):</p> <p>(Products with amoxicillin component of 400mg/5mL or 875mg per tablet).</p> <ul style="list-style-type: none"> • Usual dose: 25mg/kg/dose (to a maximum of 875mg) twice daily.⁽⁵⁾
<p>DOSAGE ADJUSTMENT</p>	<p>Dosage adjustment required in renal impairment:</p> <p>To calculate the estimated glomerular filtration rate (eGFR) use the formula available via the following link.^(6, 7) This formula should only be used for children older than one year.</p> $\text{eGFR (mL/min/1.73m}^2\text{)} = \frac{36.5 \times \text{height (cm)}}{\text{Serum creatinine (micromol/L)}}$ <p>For Oral Administration:</p> <ul style="list-style-type: none"> • Dosage adjustment may be required in cases of impaired renal function (with creatinine clearance of less than 30mL/min) due to the increased risk of crystalluria.⁽³⁾ • For patients with a creatinine clearance of less than 30mL/minute, the higher strength preparations (i.e. the 875mg/125mg tablets and 400mg/57mg per 5mL suspension) should be avoided due to the clavulanic acid component and the risk of crystalluria.⁽³⁾ • The lower strength preparations (i.e. 500mg/125mg and 125mg/31.25mg per 5 mL suspension) may be suitable.⁽³⁾ • Contact Pharmacy for further information. <p>For IV Administration:</p> <ul style="list-style-type: none"> • eGFR 10-30mL/minute/1.73m² - use normal initial dose and then use half normal dose every 12 hours.⁽³⁾ • eGFR <10mL/minute/1.73m² - use normal initial dose and then use half normal dose every 24 hours.⁽³⁾ <p>Dosage adjustment required in hepatic impairment:</p> <ul style="list-style-type: none"> • Amoxicillin with clavulanic acid is contraindicated in patients with a history of cholestatic jaundice or hepatic dysfunction associated with its use. Care should be taken when using amoxicillin with clavulanic acid in patients with hepatic impairment due to other causes, although no specific dose reductions are recommended.^(2, 4, 7)
<p>RECONSTITUTION</p>	<p>Oral suspension (Duo[®] 400mg/57mg per 5mL):</p> <ul style="list-style-type: none"> • Reconstitute with water as follows: Tap the bottle until all the powder flows freely; add approximately half the amount of water as per the manufacturer's instructions for reconstitution and shake well to suspend the powder.

	<ul style="list-style-type: none"> • Add the remainder of the water and again shake well. Store the reconstituted suspension between 2°C and 8°C and discard any remaining suspension after 7 days.⁽⁸⁾ <p>IV:</p> <ul style="list-style-type: none"> • Reconstitute the 1000/200mg vial with 20mL of water for injection to give a 50mg/mL solution of amoxicillin component. Further dilution is then required (see administration section below).^(9, 10) • Use reconstituted 50mg/mL solution immediately (stable for 20 minutes).^(9, 10)
<p>ADMINISTRATION</p>	<p>Oral suspension:</p> <ul style="list-style-type: none"> • Amoxicillin with clavulanic acid preparations should be taken immediately before food or with the first mouthful of food to minimise gastrointestinal intolerance and to optimise absorption.^(2, 4, 8, 11) • The suspension should be shaken well prior to measuring out the dose.^(4, 8) <p>IV push (Children > 3 months):</p> <ul style="list-style-type: none"> • Dilute the required dose to a final concentration of 50mg/mL or weaker and administer as a push over 3 to 5 minutes.^(9, 10) <p>Use reconstituted 50mg/mL solution immediately (stable for 20 minutes).^(9, 10)</p> <p>IV infusion:</p> <ul style="list-style-type: none"> • Dilute the required dose to a final concentration of 20mg/mL or weaker and infuse over 30 minutes.^(9, 10) • Diluted solution is stable for 4 hours at 25°C and 8 hours at 2°C to 8°C when added to a pre-refrigerated bag.^(9, 10)
<p>MONITORING</p>	<ul style="list-style-type: none"> • Renal, hepatic and haematological function should be monitored weekly with prolonged therapy (i.e. longer than 14 days).^(2, 8, 11)
<p>ADVERSE EFFECTS</p>	<p>Common: diarrhoea, nausea, transient increases in liver enzymes and bilirubin, rash.⁽²⁾</p> <p>Rare: pustular drug eruption, cholestatic hepatitis (mainly due to clavulanic acid and is usually reversible), vomiting, <i>Clostridium difficile</i>-associated diarrhoea, black tongue, neurotoxicity, bleeding, blood dyscrasias (e.g. neutropenia, thrombocytopenia).</p> <p>Immunologic reactions: include rash, erythema, urticaria, contact dermatitis, fever, anaphylactic shock, angioedema, bronchospasm, interstitial nephritis, haemolytic anaemia, eosinophilia, serum sickness-like syndrome, exfoliative dermatitis, Stevens-Johnson syndrome and toxic epidermal necrolysis.⁽²⁾</p>

COMPATIBLE FLUIDS	<ul style="list-style-type: none"> • Prepared infusions should be used immediately.^(9, 10) • Sodium chloride 0.9% (4 hours only at 25°C).^(9, 10)
STORAGE	<p>Oral preparations:</p> <ul style="list-style-type: none"> • Tablet: Store below 25°C. Protect from moisture and light.⁽⁸⁾ • Suspension: Store the un-reconstituted powder below 25°C, after reconstituting, store in the refrigerator between 2°C and 8°C and discard after 7 days.⁽⁸⁾ <p>IV preparations:</p> <ul style="list-style-type: none"> • Vial: store below 25°C. Protect from light.^(9, 10) • Reconstituted solution: stable for 20 minutes at 25°C.^(9, 10) • Diluted solution: stable in sodium chloride 0.9% for 4 hours. Stable in sodium chloride 0.9% for 8 hours at 2°C to 8°C when added to a pre-refrigerated bag.^(9, 10)
INTERACTIONS	<p>Amoxicillin with clavulanic acid may interact with other medications; please consult PCH approved references (e.g. Clinical Pharmacology), your ward pharmacist or Pharmacy on extension 63546 for more information.</p> <ul style="list-style-type: none"> • Probenecid decreases penicillin excretion by competitive renal tubule secretion, prolonging its activity; may allow use of oral rather than IV route by maintaining adequate penicillin concentration. • Allopurinol when co-administered with amoxicillin: increases risk of rash occurring; be aware of the possibility.
COMMENTS	
MANUFACTURER SAFETY DATA SHEET (SDS)	To access to the Manufacturer SDS for this product, use the following link to ChemAlert .


Please note: The information contained in this guideline is to assist with the preparation and administration of **amoxicillin with clavulanic acid**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

Related CAHS internal policies, procedures and guidelines
Antimicrobial Stewardship Policy
ChAMP Empiric Guidelines and Monographs
KEMH Neonatal Medication Protocols

References and related external legislation, policies, and guidelines

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