

Using solid dosage forms of antibiotics when liquid preparations are not available

A recent increase in group A streptococcus infection in children has led to higher than usual amounts of some oral antibiotic liquids being used. As a result, some of these liquid preparations are not always easily available. It may therefore be necessary to manipulate solid dosage forms to liquids for ease of administration to children, or those who have difficulty swallowing, so that they receive their medicine on time.

In the first instance, individuals should be encouraged to swallow oral solid dosage forms (tablets and capsules), where possible. Helpful guidance on safe administration of these preparations are available from the following websites:

- [Medicines for Children](#) provide practical advice for healthcare professionals and the public (e.g. parents/carers)
- [KidzMed](#) in partnership with NHS England provide an e-learning resource for healthcare professionals to teach individuals how to swallow tablets/capsules.

If an individual is still unable to swallow solid dosage forms, healthcare professionals may refer to table 1 below for information about the evidence, practicality and safety of converting solid dosage forms to liquids.

It is important to note the following:

- administration in this way is *off-label* (used outside of the product licence).
- when crushing tablets or opening capsules, caution should be exercised on handling the antibiotic powder produced to avoid contact sensitisation or inhalation. Safety measures that should be used include:
 - use a closed system e.g. dispersing a tablet in the barrel of a syringe.
 - wear gloves to reduce contact with the skin, and a mask to prevent dust inhalation.
 - sensitisation is a risk with all of the antibiotics but may be of particular concern with penicillins.

Prescribers should check the most up-to-date guidance from UK Health Security Agency (UKHSA) and Public Health Wales (PHW) when choosing which antibiotic to prescribe, as well as working with local pharmacy teams to consider stock availability and practicalities of administration.

There is very limited data on the administration of the oral solid dosage forms of the antibiotics via enteral feeding tubes (EFTs), as, in this situation, the liquid formulations would normally be used. Whilst further investigations are ongoing, manipulation of antibiotic solid oral dosage forms for EFT administration requires assessment on a case-by-case basis. Please contact your local [Medicines Advice Service](#) for advice on EFT administration of solid oral dosage forms.

This information is intended to be used alongside national prescribing guidance and the manufacturer's SmPC. Please consult NICE CKS, the BNF for Children and SmPC before prescribing	
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Table 1 Antimicrobial choices and considerations for liquid/solid dosage forms

Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
First Line					
Phenoxymethylpenicillin	Child 1-11 months 62.5mg four times a day or 125mg twice a day	125mg/5mL, 250mg/5mL oral solution	250mg film coated tablet	The film-coated tablets can be dispersed in water or crushed and mixed with liquid or soft food.	Consider using 125mg (half a tablet) twice daily rather than 62.5mg four times a day for children aged 1-11 months. Phenoxymethylpenicillin would normally be given half an hour before food as food slightly decreases the peak plasma concentration of the drug; however, the manufacturer acknowledges food does not appear to affect the extent of absorption. Anecdotal information suggests that phenoxymethylpenicillin tablets do not disperse well in water.
	Child 1-5 years 125mg four times a day or 250mg twice a day				
	Child 6-11 years 250mg four times a day or 500mg twice a day				
	Child 12 years - adult 500mg four times a day or 1g twice a day				
	Duration 10 days				
					<p>Particular risk of sensitisation. Always wear gloves and mask and use a closed system where possible.</p> <p>Parents/carers with penicillin allergy should avoid involvement in preparing and administering.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable) Contact your local Medicines Advice Service for further information. Contact details can be found at www.wmic.wales.nhs.uk</p>

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Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
If phenoxymethylpenicillin unavailable					
Amoxicillin	<p>Child 1-11 months 125mg three times a day</p> <p>Child 1-4 years 250mg three times a day</p> <p>Child 5-11 years 500mg three times a day</p> <p>Child 12 years - adult 500mg three times a day</p> <p>Duration 10 days</p>	125mg/5mL, 250mg/5mL, 500mg/5mL oral suspension	250mg, 500mg capsules	The capsules can be opened and the contents tipped out and mixed with liquid or soft food.	<p>Children under 1 year require a 125mg dose only measurable using liquid.</p> <p>Anecdotal information - does not disperse well in water.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable)</p> <p>Contact your local Medicines Advice Service for further information. Contact details can be found at www.wmic.wales.nhs.uk</p>

Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
Second Line (if first line options unavailable) OR in individuals with true PENICILLIN allergy					
Clarithromycin	<p>Child 1 month - 11 years:</p> <p>Weight under 8kg: 7.5mg/kg twice a day</p> <p>Weight 8-11kg: 62.5mg twice a day</p> <p>Weight 12-19kg: 125mg twice a day</p> <p>Weight 20-29kg: 187.5mg twice a day</p> <p>Weight 30-40kg: 250mg twice a day</p> <p>Child 12 years - adult 250mg-500mg twice a day</p> <p>Duration 5 or 10 days according to the latest guidance by Public Health Wales for Streptococcus A infection and scarlet fever in children</p>	125mg/5mL, 250mg/5mL oral suspension	250mg, 500mg film coated tablets 500mg modified release tablet 250mg granules	The film coated tablets can be crushed and mixed with liquid or soft food, or dispersed in water. Use granules if available and dose is a multiple of 250mg.	<p>For doses that cannot be given to the nearest half tablet (125mg), the liquid must be used or consider an alternative macrolide.</p> <p>Modified release tablets must not be crushed.</p> <p>Granules (if available) can be mixed with a small amount of soft food or a small drink. It should be taken straight away without chewing and ensure full dose is taken.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable) Contact your local Medicines Advice Service for further information. Contact details can be found at www.wmic.wales.nhs.uk</p>
OR					

Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
Erythromycin	<p>Child 1-23 months 125mg four times a day or 250mg twice daily</p> <p>Child 2-7 years 250mg four times a day or 500mg twice daily</p> <p>Child 8 years - adult 250mg-500mg four times a day or 500mg-1000mg twice a day</p> <p>Duration 5 or 10 days according to the latest guidance by Public Health Wales for Streptococcus A infection and scarlet fever in children</p>	125mg/5mL, 250mg/5mL, 500mg/5mL oral suspension	250mg, 500mg film coated tablet 250mg gastro resistant tablet	The film-coated tablets can be crushed and mixed with liquid or soft food, or dispersed in water.	<p>Gastro resistant or enteric coated tablets should not be crushed.</p> <p>Consider using half a tablet or full tablet for doses.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable) Contact your local Medicines Advice Service for further information. Contact details can be found at www.wmic.wales.nhs.uk</p>
OR					

Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
Azithromycin	<p>Child 6 months - 11 years 12mg/kg (max. per dose 500mg) once a day</p> <p>Child 12 years - adult 500mg once a day</p> <p>Duration 5 days</p>	200mg/5mL oral suspension	250mg, 500mg film coated tablets 250mg capsules	<p>The film coated tablets can be crushed and mixed with liquid or soft food, or dispersed in water.</p> <p>Capsules can be opened and the contents tipped out and mixed with liquid or soft food.</p>	<p>Dose in multiples of 125mg.</p> <p>Weight based dose for under 12 years.</p> <p>Children under 10.5 kg require a dose only measurable using liquid.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable) Contact your local Medicines Advice Service for further information. Contact details can be found at www.wmic.wales.nhs.uk</p>

Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
Third Line (where other agents unavailable)					
Cefalexin	<p>Child 1-11 months 125mg twice a day</p> <p>Child 1-4 years 125mg three times a day</p> <p>Child 5-11 years 250mg three times a day</p> <p>Child 12 years - adult 500mg three times a day</p> <p>Duration 10 days</p>	125mg/5mL, 250mg/5mL, oral suspension	250mg, 500mg film coated tablet 250mg, 500mg capsules	The film coated tablets can be crushed and mixed with liquid or soft food, or dispersed in water. Capsules can be opened and the contents tipped out and mixed with liquid or soft food.	<p>Dose in multiples of 125mg.</p> <p>Anecdotal information- does not disperse well in water.</p> <p>Consider using half a tablet for doses.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable) Contact your local Medicines Advice Service for further information. Contact details can be found at www.wmic.wales.nhs.uk</p>
OR					

Antimicrobial	Doses used (for group A streptococcal cases)	Liquid dosage forms	Solid dosage forms	Options if liquid not available	Considerations
Clindamycin	<p>Child 1 month - 17 years (weight under 70kg) 7mg/kg (max 300mg) three times a day</p> <p>Child over 70kg - adult 450mg three times a day</p> <p>Duration 10 days</p>	Oral suspension (imports)	75mg, 150mg, 300mg capsules	Capsules can be opened and the contents mixed with liquid or soft food.	<p>Dalacin C® capsules open easily and powder pours from capsule when squeezed; take care to ensure entire capsule contents are emptied. The powder is extremely unpleasant in taste. They can be mixed with grape juice or maple syrup.</p> <p>Enteral feeding tubes (when licensed liquid formulations are unavailable) The capsules can be opened and the contents dispersed in water. No indication of any feed interaction with clindamycin. The powder mixes easily with water and flushes via an 8Fr NG tube without blockage. Specific site of absorption is not documented.</p>

Advice for parents and carers

Directions to show parents/carers/individuals how to prepare the required dose of medication can be found in the [Patient Information Leaflet \(PIL\)](#) specially produced for this purpose by the Welsh Medicines Advice Service.

Parents or carers with an allergy to the antibiotic supplied should avoid preparing and administering the preparation. A different responsible adult without an allergy to the antibiotic would need to do this instead.

More information about the off-label use of medicines in children is available from the Medicines for Children website (www.medicinesforchildren.org.uk).

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