

Antibiotic administration when liquid preparations are not available

A practical guide for healthcare professionals

Sometimes it is necessary to manipulate solid dosage forms of antibiotics to liquids for ease of administration to children, or those who have difficulty swallowing. This can be especially important if there is a shortage of antibiotics to ensure medication is received on time.

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.

Swallowing solid dosage forms

If liquid forms of a suitable antibiotic are not available, individuals should first be encouraged to swallow oral solid dosage forms (tablets or 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
- [KidzMed](#) in partnership with NHS England provide an e-learning resource for healthcare professionals to teach individuals how to swallow tablets/capsules
- [KidzMedz Cymru](#) teaches children and young people how to safely swallow tablets – check with local teams for resources and training packs

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

Off-label use

It is important to note that administration via conversion of a solid dosage form to liquid is **off-label** (used outside of the product licence). When prescribing off-label, the prescriber accepts a greater responsibility for using the medicine as it may result in more risks.

For more information about the off-label use of medicines in children see [Medicines for Children](#) and the [MHRA](#).

Safety information – converting solid dosage form to liquid

When crushing tablets or opening capsules, caution should be exercised on handling the antibiotic powder produced to avoid contact sensitisation or inhalation. The following safety measures should be adhered to:

- wear gloves to reduce contact with the skin, and a mask to prevent dust inhalation
- where possible, disperse the tablet instead of crushing (e.g. in the barrel of a syringe), particularly if there is a chance of repeated exposure
- if crushing is necessary, ensure PPE is worn (gloves and mask)

Sensitisation is a risk with all of the antibiotics but is of particular concern with penicillins.

Masking the taste

The solid form antibiotic may have a bitter taste when dispersed or crushed. Combining with a strongly flavoured drink (i.e. blackcurrant cordial) or food (i.e. jam or apple sauce) where possible may improve palatability.

If combining with food or drink

- use a small amount of the food or drink (i.e. a teaspoonful) so you can be sure the child eats it all and swallows the whole dose
- it might be helpful to use an oral syringe for liquids
- after mixing the crushed tablet/contents of the capsule with food or drink, make sure it is given straight away

Enteral feeding tubes

There is very limited data on the administration of the oral solid dosage forms of antibiotics via enteral feeding tubes (EFTs). 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.

Advice for parents and carers

Directions to show parents, carers and individuals on 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.

Antibiotic-specific information

Phenoxymethylpenicillin	3
Amoxicillin	3
Clarithromycin.....	4
Erythromycin.....	4
Azithromycin	5
Cefalexin	5
Clindamycin	6

Phenoxymethylpenicillin

Liquid dosage forms

125 mg / 5 mL, 250 mg / 5 mL oral solution

Solid dosage forms

250 mg film coated tablet

Options if liquid not available

The film-coated tablets can be dispersed in water or crushed and mixed with liquid or soft food.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

Consider using 125 mg (half a tablet) twice daily rather than 62.5 mg four times a day for children aged 1-11 months, if appropriate for the indication.

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.

Particular risk of sensitisation. Always wear gloves and mask and use a closed system where possible.

Parents/carers with penicillin allergy should avoid involvement in preparing and administering.

Amoxicillin

Liquid dosage forms

125 mg / 5 mL, 250 mg / 5 mL, 500 mg / 5 mL oral suspension

Solid dosage forms

250 mg, 500 mg capsules

Options if liquid not available

The capsules can be opened and the contents tipped out and mixed with liquid or soft food.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

For most indications, children under 1 year require a 125 mg dose that is only measurable using liquid.

Anecdotal information - does not disperse well in water.

Parents/carers with penicillin allergy should avoid involvement in preparing and administering

Clarithromycin

Liquid dosage forms

125 mg / 5 mL, 250 mg / 5 mL oral suspension

Solid dosage forms

250 mg, 500 mg film coated tablets

500 mg modified release tablet

250 mg granules

Options if liquid not available

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 250 mg.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

For doses that cannot be given to the nearest half tablet (125 mg), the liquid must be used or consider an alternative macrolide.

Modified release tablets must not be crushed.

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.

Erythromycin

Liquid dosage forms

125 mg / 5 mL, 250 mg / 5 mL oral suspension

Solid dosage forms

250 mg, 500 mg film coated tablet

250 mg gastro resistant table

Options if liquid not available

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 250 mg.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

Gastro resistant or enteric coated tablets should not be crushed.

Consider using half a tablet or full tablet for doses.

Azithromycin

Liquid dosage forms

200 mg / 5 mL oral suspension

Solid dosage forms

250 mg, 500 mg film coated tablets

250 mg capsules

Options if liquid not available

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.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

Dose in multiples of 125 mg.

Weight based dose for under 12 years.

Children under 10.5 kg require a dose only measurable using liquid.

Cefalexin

Liquid dosage forms

125 mg / 5 mL, 250 mg / 5 mL, oral suspension

Solid dosage forms

250 mg, 500 mg film coated tablet

250 mg, 500 mg capsules

Options if liquid not available

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.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

Dose in multiples of 125 mg.

Anecdotal information - does not disperse well in water.

Consider using half a tablet for doses.

Parents/carers with penicillin or cephalosporin allergy should avoid involvement in preparing and administering

Clindamycin

Liquid dosage forms

Oral suspension (imports)

Solid dosage forms

75 mg, 150 mg, 300 mg capsules

Options if liquid not available

Capsules can be opened and the contents mixed with liquid or soft food.

Doses

Refer to the [BNF](#) or [BNFC](#), local antimicrobial guidelines, [NICE CKS](#) or [AWMSG primary care antimicrobial guidelines](#).

Considerations

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.

Information for 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 8 Fr NG tube without blockage
- specific site of absorption is not documented

References

Joint Formulary Committee. British National Formulary (online). London: BMJ Group and Pharmaceutical Press. Available at: <https://www.medicinescomplete.com/#/> [Accessed Jan 2024].

Medicines for children. London: Royal College of Paediatrics and Child Health (online), Neonatal & Paediatric Pharmacists Group, WellChild Available at: <http://www.medicinesforchildren.org.uk/> [Accessed Jan 2024].

Paediatric Formulary Committee. BNF for Children (online). London: BMJ Group, Pharmaceutical Press, and RCPCH Publications. Available at: <https://www.medicinescomplete.com/#/> [Accessed Jan 2024].

Smyth J, editor. The NEWT Guidelines (online). Wrexham: Betsi Cadwaladr University Local Health Board (Eastern Division). Available at: <http://www.newtguidelines.com/> [Accessed Jan 2024].

Specialist Pharmacy Service. Using solid oral dosage form antibiotics in children. Last Updated: 29 December 2022. Available at: <https://www.sps.nhs.uk/articles/using-solid-oral-dosage-form-antibiotics-in-children/> [Accessed Jan 2024].

White R, Bradnam V, editors. Handbook of Drug Administration via Enteral Feeding Tubes (online). London: Pharmaceutical Press; 2023. Available at: <https://www.medicinescomplete.com/#/browse/tubes> [Accessed Jan 2024].