

Specials Guidance

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NHS Somerset ICB Medicines Management Team

Entries in green are those that have been added or amended since the last full version review completed in March 2022

Disclaimer: This document is intended as a guide only - it is subject to clinical interpretation and judgement on an individual basis and the specific needs and best interests of the individual patient should be considered. It contains a list of commonly prescribed medicines and alternative methods of administration for patients with swallowing difficulties, feeding tubes or for patients prescribed unlicensed 'specials' medication. It considers alternative medicines, formulations, cost, and licensing. The list of medicines is not exhaustive. Prices of medicines may fluctuate.

It is advised that while every effort will be made to keep the information in this document current and correct, errors may have occurred and data for individual drugs may have changed. Where there is any doubt or if further information is needed – prescribers should check the manufacturers' recommendations, published literature or other specialist sources e.g. NEWT Guidelines, Handbook of Drug Administration via Enteral Feeding Tubes.

SPECIALS GUIDANCE

CONTENTS

	Page
Background	3
Specialist Pharmacy Service useful links	4
Specials Recommended by the British Association of Dermatologists (BAD) for Skin Disease	4
A to Z Quick Wins	5
Appendix i Links to leaflets describing how to use oral syringes	67
Appendix ii General Guidelines: Administration of drugs via feeding tubes	68
References	70

Background

Medicines are not always available in formulations that are suitable for patients with swallowing difficulties or for patients with enteral feeding tubes. The alteration of medication formulations may therefore be necessary, such as crushing tablets or prescribing a 'special' liquid formulation.

This document provides guidance on available licensed formulations, suggests options for treatment within a drug class, or advises where tablets may be crushed, or capsules opened.

Whilst there is some information with regard to administration via feeding tubes, prescribers are advised to contact the NHS Somerset ICB Medicines Management team for full details if administration via a feeding tube is necessary.

Licensed or Unlicensed?

Any alteration in the formulation of a medicine means that the medicine is used outside its product licence. The manufacturer of the product is no longer responsible for any adverse event or treatment failure. Instead, professionals responsible for prescribing, supplying and administering the drugs, become liable for any adverse event that the patient may experience.

Medications should only be given in an unlicensed manner when a licensed alternative is not available. Licensed routes of administration should be sought first.

When prescribing alternatives (licensed/ unlicensed) it is important to consider:

- Dose adjustments that need to be made with alternative liquid/ injection preparations.
- Full dose directions need to be included on the prescription (if applicable) e.g. *'take one tablet, disperse in water and take once in the morning'*.

This document provides an A-Z list of drugs:

- Where alternative licensed preparations exist.
- Drugs that can be crushed or dispersed in water (unlicensed route of administration)
- Injections that can be given orally/enterally (unlicensed route of administration).

If a drug does not appear in the A-Z table, there may be no alternative but to prescribe the 'special' product. In this case try to select a 'special' listed in Part VIII B of the Drug Tariff as these are price controlled.

If a special is prescribed, the prescriber should consider the following:

- They are prescribing an unlicensed medicine.
- That the product, even though prepared in a manufacturing unit, has not been assessed by the Licensing Authority for safety, quality and efficacy (therefore still unlicensed).
- That they are directly responsible for the prescribing of these products and that they may be liable for adverse effects or harm resulting from the use of that product.
- It is the prescriber's responsibility to decide whether the patient has 'special needs' which a licensed product cannot meet.
- Requests to prescribe unlicensed specials by a third party, e.g. secondary care, do not diminish the responsibility of the prescriber.

Please note: Every effort has been made to ensure the information in this document is current and correct, however errors may have occurred and data for individual drugs may have changed. Where there is any doubt, information should be checked against manufacturers' recommendations, published literature or other specialist sources.

Specialist Pharmacy Service useful links

- Swallowing difficulties
<https://www.sps.nhs.uk/home/guidance/swallowing-difficulties/>
- Choosing formulations of medicines for adults with swallowing difficulties
<https://www.sps.nhs.uk/articles/choosing-formulations-of-medicines-for-adults-with-swallowing-difficulties/>
- Switching between liquid and tablet/capsule formulations – Which medicines require extra care?
<https://www.sps.nhs.uk/articles/switching-between-liquid-and-tablet-capsule-formulations-which-medicines-require-extra-care/>
- Crushing tablets or opening capsules in a care home setting
<https://www.sps.nhs.uk/articles/crushing-tablets-or-opening-capsules-in-a-care-home-setting/>
- How enteral feeding tubes affect medicines
<https://www.sps.nhs.uk/articles/how-enteral-feeding-tubes-affect-medicines/>
- Parkinson's disease medicines formulations for adults with swallowing difficulties
<https://www.sps.nhs.uk/articles/parkinsons-disease-medicines-formulations-for-adults-with-swallowing-difficulties/>
- Giving medicines safely with food or thickened fluid
<https://www.sps.nhs.uk/articles/giving-medicines-safely-with-food-or-thickened-fluid/>
- Preparing medicines for administration to adults with swallowing difficulties
<https://www.sps.nhs.uk/articles/preparing-medicines-for-administration-to-adults-with-swallowing-difficulties/>

Specials Recommended by the British Association of Dermatologists (BAD) for Skin Disease

A list of the latest preferred dermatological preparations (Specials) recommended by BAD can be downloaded here:

<https://cdn.bad.org.uk/uploads/2021/12/29200146/BAD-Specials-Booklet-2018-FINAL.pdf>

Drug	Formulation Alternative / Administration Advice
A	
<i>Acarbose</i>	<p>No licensed liquid formulation available.</p> <p>Tablets can be chewed with the first mouthful of food or swallowed whole with a little liquid immediately before food.¹</p>
<i>Acebutolol</i>	<p>No licensed liquid formulation available.</p> <p>Consider alternative licensed beta-blocker preparation: see Atenolol / Propranolol.</p> <p>or</p> <p>Prescribe licensed Acebutolol capsules which can be opened, and the contents dispersed in water before taking.¹</p>
<i>Acenocoumarol</i>	<p>No licensed liquid formulation available.</p> <p>Tablets will disperse in water. Prescribe Acenocoumarol tablets and label “disperse tablet in water immediately before taking”¹</p>
<i>Acetazolamide</i>	<p>No licensed liquid formulation available.</p> <p>Prescribe Acetazolamide tablets (non-MR) and label 'disperse tablet in water and take...' (Tablets are scored so can be halved or quartered).</p> <p>Modified Release capsules contain slow-release pellets – do not crush.¹</p> <p>or</p> <p>Last resort – use an unlicensed special listed in the Drug Tariff. Prescribe Acetazolamide 250mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Acetylcysteine</i>	<p>Licensed products:</p> <p>Acetylcysteine 200mg oral powder sugar-free sachets</p> <p>NACSYS® 600mg effervescent tablets Available in packs of 3x10 tablets. Licensed for use as a mucolytic in respiratory disorders for adults only.</p>
<i>Acetylcysteine 5% Eye drops</i>	Available as licensed Ilube® Eye drops

Drug	Formulation Alternative / Administration Advice
<i>Aciclovir</i>	<p>Prescribe licensed Aciclovir dispersible tablets.</p> <p>or</p> <p>Licensed liquid formulation is Aciclovir oral suspension sugar free 200mg/5ml or 400mg/5ml.</p>
<i>Alendronic Acid</i>	<p>If liquid preparation required, consider either:</p> <p>Licensed Alendronic acid oral solution sugar-free 70mg/100ml</p> <p>or</p> <p>Alendronic acid 70mg effervescent tablet (Binosto®) dissolved in at least 120ml water</p> <p>or</p> <p>Denosumab (Prolia®) 60mg/1ml solution for injection pre-filled syringe</p>
<i>Alfacalcidol</i>	<p>Licensed liquid formulation is Alfacalcidol (One-Alpha®) 2micrograms/ml oral drops sugar free</p> <p>N.B. Using the integral dropper, ONE drop ~ 100 nanograms (= 0.1 micrograms)</p>
<i>Alimemazine</i>	<p>Consider an alternative licensed antihistamine preparation.</p> <p>or</p> <p>Prescribe licensed liquid formulation Alimemazine oral solution sugar free (Zentiva) 7.5mg/5ml or 30mg/5ml</p>
<i>Allopurinol</i>	<p>No licensed liquid formulation available.</p> <p>Prescribe Allopurinol tablets and label 'crush tablet, mix with water and take...'</p> <p>Tablets may take 10 minutes to disperse. Stir the dispersion and use immediately as the dispersion settles quickly.²</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Allopurinol 100mg/5ml or 300mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Almotriptan</i>	<p>No licensed liquid formulation available.</p> <p>Consider orodispersible zolmitriptan or rizatriptan</p>

Drug	Formulation Alternative / Administration Advice
<i>Alpha-tocopherol</i>	See 'Vitamin E'
<i>Amiloride</i>	Licensed liquid formulation is Amiloride 5mg/5ml oral solution sugar free
<i>Amiodarone</i>	<p>No licensed liquid formulation.</p> <p>Prescribe Amiodarone tablets and label 'disperse tablet in water and take...'</p> <p>N.B. The tablets have a bitter taste and can be mixed with fruit juice if desired (if not administered via enteral feeding tube).²⁸</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Amiodarone 50mg/5ml or 100mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Amisulpride</i>	Licensed liquid formulation is Amisulpride 100mg/ml oral solution sugar free (Solian® brand has been discontinued)
<i>Amitriptyline</i>	<p>Licensed liquid formulation is Amitriptyline oral solution sugar free 25mg/5ml or 50mg/5ml</p> <p>(Adjust dose directions as necessary. Note: The 10mg/5ml strength is very expensive)</p>
<i>Amlodipine</i>	<p>Licensed liquid formulation is Amlodipine oral solution sugar free 5mg/5ml or 10mg/5ml</p> <p>or</p> <p>Prescribe Amlodipine tablets and label 'disperse tablet in water and take immediately...' (solution is light sensitive hence immediate administration).</p> <p>(Crushed tablets can also be mixed in a small amount of food such as yogurt, honey, or mashed potato.²³)</p> <p>or</p> <p>Consider alternative licensed calcium channel blocker: see Verapamil.</p>

Drug	Formulation Alternative / Administration Advice
<i>Anastrozole</i>	<p>No licensed liquid formulation. Prescribe Anastrozole tablets and label ' disperse tablet in water and take...'</p> <p>Tablets are slow to disperse and may take in excess of 5 minutes. ¹</p> <p>Caution - risk to pregnancy. Women who are pregnant / may become pregnant should not handle crushed or broken tablets. It may be advisable to use a closed system to administer anastrozole²⁸.</p>
<i>Apixaban</i>	<p>Apixaban (Eliquis®) tablets may be crushed and suspended in water, or 5% glucose in water (G5W), or apple juice or mixed with apple puree and immediately administered orally. Eliquis® tablets are licensed to be administered in this way.¹³</p> <p><u>Feeding tubes:</u></p> <p>Eliquis® tablets may be crushed and suspended in 60 mL of water or G5W and immediately delivered through a nasogastric tube. Eliquis® tablets are licensed to be administered in this way.¹³</p> <p>Crushed tablets are stable in water, G5W, apple juice, and apple puree for up to 4 hours.¹³</p> <p>Data suggests that crushed tablets given via an enteral tube have a similar pharmacokinetic profile to whole tablets in terms of absorption.^{11,13}</p>
<i>Aripiprazole</i>	Licensed orodispersible tablets and liquid available.
<i>Atenolol</i>	Licensed liquid formulation is Atenolol 25mg/5ml oral solution sugar free
<i>Atomoxetine</i>	Licensed liquid formulation is Atomoxetine 4mg/ml oral solution (Strattera®)

Drug	Formulation Alternative / Administration Advice
<i>Atorvastatin</i>	<p>Consider age of patient and if still clinically appropriate.</p> <p>Consider licensed Atorvastatin chewable tablets sugar free (Lipitor®) available as 10mg and 20mg chewable tablets.</p> <p>Or</p> <p>Atorvastatin 20mg/5ml oral suspension sugar free (Rosemont) – high cost option</p> <p>Or</p> <p>Prescribe Atorvastatin tablets and label 'crush tablet and mix with water and take...'. Give immediately as the drug is light sensitive²⁸.</p> <p>Or</p> <p>See Rosuvastatin monograph – Rosuvastatin hard capsule can be opened and the granules inside are also licensed to be administered via nasogastric tubing (see SPC for instructions)³⁹.</p>
<i>Atropine Eye drops</i> <i>(preservative-free)</i>	<p>Minims® Atropine Sulphate 1% w/v may be suitable alternative. No potentially sensitising excipients. ¹⁰</p>
<i>Azathioprine</i>	<p>Cytotoxic Drug: should not be crushed/ dissolved in primary care.</p> <p>Consider using an unlicensed special listed in the Drug Tariff.</p> <p>Prescribe Azathioprine 20mg/5ml, 25mg/5ml, 50mg/5ml or 100mg/5ml oral suspension (unlicensed but price controlled.)</p>
B	
<i>Baclofen</i>	<p>Licensed liquid formulations are Baclofen 5mg/5ml oral solution sugar free and Baclofen 10mg/5ml oral solution sugar free</p> <p>N.B. Sugar-free liquids contain sorbitol, therefore if diarrhoea develops or for higher doses consider prescribing Baclofen tablets and label 'disperse tablet in water and take...'¹</p>

Drug	Formulation Alternative / Administration Advice
<i>Bendroflumethiazide</i>	<p>No licensed liquid formulation available</p> <p>Prescribe Bendroflumethiazide Tablets and label 'disperse tablets in water and take...'¹</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Bendroflumethiazide 2.5mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Betahistine</i>	<p>Prescribe Betahistine Tablets and label 'crush or disperse tablet in water and take...'¹,²</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Betahistine 8mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Betaine</i>	RED drug – refer to secondary care
<i>Bezafibrate</i>	Prescribe Bezafibrate Tablets (non-MR) and label 'crush or disperse tablet, dissolve slowly in water and take...'¹
<i>Bisoprolol</i>	<p>Consider alternative licensed beta-blocker preparation: see Atenolol / Propranolol.</p> <p>or</p> <p>Prescribe Bisoprolol Tablets and label 'crush tablet finely then mix with water and take...'¹</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Bisoprolol 1.25mg/5ml, 2.5mg/5ml or 5mg/5ml oral solution. (Unlicensed but price controlled. Drug tariff prices vary between strengths/ formulations. Please check the latest drug tariff to identify the most cost effective special formulation before prescribing.)</p>
<i>Bumetanide</i>	Licensed liquid formulation is Bumetanide 1mg/5ml oral solution sugar free
<i>Buspirone</i>	Consider another anxiolytic with licensed liquid formulation: see Diazepam
C	

Drug	Formulation Alternative / Administration Advice
<i>Cabergoline</i>	<p>No licensed liquid formulation available.</p> <p>Prescribe Cabergoline tablets and label 'crush tablet, mix with water and take...'¹</p>
<i>Calcium Salts</i>	<p>See Calcium and Vitamin D preps for osteoporosis prevention.</p> <p>Calcium only preps:</p> <p>Calcium Gluconate 1g effervescent tablets</p> <p>Calcium Carbonate 1.25g effervescent tablets sugar free</p> <p>Calvive-1000[®] effervescent tablets (formerly Sandocal-1000[®])</p> <p>See BNF for further details on salts.</p>
<i>Calcium with Vitamin D</i>	<p>TheiCal-D3 1000mg/880 IU chewable tablets</p> <p>Adcal D3[®] Dissolve effervescent tablets</p> <p>Calfovit D3[®] powder</p> <p>Calci-D[®] chewable tablets</p> <p>See BNF for further details on ingredients and salts.</p>
<i>Candesartan</i>	<p>Depending on indication, consider changing to</p> <p>Licensed Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Licensed Ramipril 2.5mg/5ml oral solution sugar free</p> <p>or</p> <p>Losartan tablets which can be crushed and dispersed in water before taking ²⁸</p>
<i>Captopril</i>	<p>Licensed liquid formulations are Captopril 5mg/5ml oral solution sugar free and Captopril 25mg/5ml oral solution sugar free</p> <p>or</p> <p>Prescribe Captopril tablets and label 'disperse tablet in water and take...'¹</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Carbamazepine</i></p>	<p>Licensed liquid formulation is Carbamazepine 100mg/5mL SF Liquid (Tegretol®)</p> <p>or</p> <p>Prescribe licensed Carbamazepine 125mg or 250mg Suppositories (Tegretol®)</p> <p>N.B. Different preparations may vary in bioavailability, avoid unnecessary changes in formulation. Note MHRA guidance on changing formulation/manufacturers for epileptic patients. Suppositories are licensed for a maximum of 7 days and maximum licensed dose of 1g/day. 125mg suppositories may be considered to be approximately equivalent in therapeutic effect to tablets of 100mg but final adjustment should always depend on clinical response (plasma concentration monitoring recommended).³</p> <p>See BNF or SPC for further information.</p> <p><u>Enteral tubes:</u></p> <ul style="list-style-type: none"> - dilute liquid with an equal volume of water before administration to prevent adsorption to the feeding tube^{1,28}. - A prolonged break in feeding is not necessary¹ but care must be taken to administer carbamazepine at the same time and in the same manner each day so that variations in the extent of drug absorption are minimised. The possibility of enteral feed interactions should be considered in any patient who fails to achieve satisfactory carbamazepine levels. An alteration in carbamazepine handling should be considered in any patient who commences or discontinues enteral feeds, and drug level monitoring should be carried out if appropriate.²⁸ <p>Take care when switching from tablet to liquid formulations. See separate document for more details.²⁷</p>
<p><i>Carbimazole</i></p>	<p>No licensed liquid formulation available.</p> <p>Licensed Carbimazole tablets can be crushed and dispersed in water.²⁸</p> <p>Consider using an unlicensed special listed in the Drug Tariff - Carbimazole 10mg/5ml oral suspension (unlicensed but price controlled).</p>
<p><i>Carbocisteine</i></p>	<p>Licensed liquid formulations:</p> <p>Carbocisteine 250mg/5ml oral solution</p> <p>or</p> <p>Carbocisteine 750mg/10ml sugar free oral solution 10ml in sachets</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Carmellose Eye drops</i> (Preservative-free)</p>	<p>There are a number of preservative-free carmellose eye drops including:</p> <p>Evolve Carmellose® 0.5% preservative-free 1x10ml bottle</p> <p>Celluvisc 0.5% or 1% (30 x 0.4ml preservative free single dose unit).</p> <p>PF Drops® carmellose (0.5% and 1% available)</p> <p>Xailin® Fresh 0.5% 0.4ml unit dose</p>
<p><i>Carvedilol</i></p>	<p>Consider alternative licensed beta-blocker preparation: see Atenolol / Metoprolol / Bisoprolol / Propranolol.</p> <p>or</p> <p>Prescribe Carvedilol tablets and label 'Disperse tablet in water and take...' (will form a suspension in water). Tablets disperse in 1-5 minutes. Use immediately.²⁸</p> <p>Crushed carvedilol tablets can also be mixed with a small amount of soft food such as yogurt, honey or mashed potato. Should be swallowed straight away, without chewing.²³</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Carvedilol 5mg/5ml oral suspension (unlicensed but price controlled.)</p>
<p><i>Celecoxib</i></p>	<p>No licensed liquid formulation available.</p> <p>Consider alternative licensed non-steroidal anti-inflammatory drug: see Ibuprofen / Meloxicam</p>
<p><i>Chloral hydrate</i></p>	<p>Licensed liquid formulation is Chloral hydrate 143.3mg/5ml oral solution but it is very expensive</p> <p>or</p> <p>Last resort - use the unlicensed Drug Tariff special Chloral hydrate 500mg/5ml oral solution (The 1g/5ml and 200mg/5ml oral solution are much more expensive).</p> <p>Take care when switching from tablet to liquid formulations. See separate document for more details.²⁷</p>
<p><i>Chloramphenicol</i> <i>Preservative-free eye drops</i></p>	<p>Prescribe licensed Minims® Chloramphenicol 0.5ml single dose units or licensed Eykappo® 5mg /ml preservative-free eye drops (10ml bottle with shelf life of 28 days after opening.)</p>

Drug	Formulation Alternative / Administration Advice
<i>Chlordiazepoxide</i>	Consider changing to licensed Diazepam 2mg/5ml oral solution
<i>Chlorphenamine</i>	Prescribe licensed Chlorphenamine 2mg/5ml oral solution sugar free
<i>Chlorothiazide</i>	<p>No licensed liquid formulations available.</p> <p>Tablets (if available) will disperse in water. ²⁸</p> <p>Or prescribe unlicensed Drug Tariff special Chlorothiazide 250mg/5ml oral suspension. (The 200mg/5ml oral suspension is more expensive)</p>
<i>Chlorpromazine</i>	Licensed liquid formulations are Chlorpromazine Oral Solution 25mg/5ml or 100mg/5ml
<i>Ciclosporin Eye drops / Eye ointment</i>	Prescribe as licensed Ikervis® (unpreserved ciclosporin eye drops). See Somerset CCG Traffic Light Guidance (green drug) for further information
<i>Ciclosporin (oral)</i>	RED drug – refer to secondary care.
<i>Cimetidine</i>	<p>Prescribe licensed Cimetidine 200mg/5ml oral solution or Cimetidine 200mg/5ml oral solution sugar free</p> <p><u>Feeding tubes:</u></p> <ul style="list-style-type: none"> - Oral solution can be diluted and administered via feeding tube. - Allow feeding gap of one hour before and one hour after each dose ^{28,36}
<i>Cinnarizine</i>	<p>Stugeron® 15mg tablets may be sucked or chewed.¹</p> <p>Cinnarizine tablets will disperse in water. ^{14,28}</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Ciprofloxacin</i></p>	<p>Prescribe licensed Ciprofloxacin 250mg/5ml oral suspension (Ciproxin®) unless administering via enteral feeding tube. It is very thick and will block the tube.²⁸</p> <p><u>Feeding tubes:</u></p> <ul style="list-style-type: none"> - do not use the suspension - Ciprofloxacin tablets will disperse in de-ionised water e.g. water for injection or water for irrigation. (Crush higher strength 750mg tablets before dispersing). Flush the enteral tube after each dose with 65ml de-ionised water. Tap water is not suitable as minerals in the tap water may bind with ciprofloxacin and decrease the amount of drug absorbed²⁸ - use doses at the higher end of the normal range in order to compensate for lower absorption, especially for administration via jejunal tube. It may be more appropriate to use an alternative route or alternative drug²⁸. - allow feeding gap of two hours before and two hours after each dose^{28,36}.
<p><i>Ciprofloxacin eye drops (Preservative-free)</i></p>	<p>Preservative-free ciprofloxacin eye drops are not suitable for use in primary care – only 24 hour shelf life as cannot be refrigerated.¹⁰</p> <p>Licensed levofloxacin preservative-free (Oftequin®) single dose 0.3ml units are a preservative free alternative.</p>
<p><i>Citalopram</i></p>	<p>Licensed liquid formulation is Citalopram 40mg/ml oral drops sugar free and label 'mix citalopram oral drops with water before taking...'. N.B. Four drops (8mg) is equivalent in therapeutic effect to 10mg citalopram tablets.</p> <p>Take care when switching from tablet to liquid formulations - see separate document²⁷ and BNF for further details.</p>
<p><i>Clindamycin</i></p>	<p>Where clinically appropriate change to an alternative antibiotic available as a liquid.</p> <p>Clindamycin capsules can be opened and powder dispersed in water.¹ Give immediately.</p> <p>Avoid inhalation of capsule contents.</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Clindamycin 75mg/5ml oral suspension (unlicensed but price controlled.)</p>

Drug	Formulation Alternative / Administration Advice
<i>Clobazam</i>	<p>Licensed liquid formulations are Clobazam 5mg/5ml and Clobazam 10mg/5ml oral suspension sugar-free</p> <p>Take care when switching from tablet to liquid formulations - see separate document²⁷</p>
<i>Clomipramine</i>	<p>Consider alternative licensed tricyclic antidepressant: see Amitriptyline / Lofepramine</p> <p>or</p> <p>Clomipramine capsules can be opened and contents mixed with water. ¹ (Modified release capsules have been discontinued but if available should not be crushed.)</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Clomipramine 50mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Clonazepam</i>	<p>Licensed liquid formulations are Clonazepam 2mg/5ml oral solution sugar free and Clonazepam 500micrograms/5ml oral solution sugar free</p> <p>or</p> <p>Prescribe Clonazepam tablets and label as 'disperse tablet in water and take...'¹</p> <p><u>Feeding tubes:</u></p> <p>Dilute with 30-60mL water to reduce binding to the tube.²</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff Clonazepam 2.5mg/1ml drops (10ml minimum quantity) Unlicensed but price controlled.</p>
<i>Clonidine</i>	<p>Licensed Clonidine 50 micrograms/5ml oral solution sugar-free now available.</p> <p>or</p> <p>Prescribe Clonidine Tablets (Catapres®) and label 'crush tablet, mix with water and take...'¹</p>

Drug	Formulation Alternative / Administration Advice
<i>Clopidogrel</i>	<p>No licensed liquid formulation available.</p> <p>Prescribe Clopidogrel tablets and label 'disperse tablet in water and take immediately...'¹</p> <p>(can take one to five minutes to disperse completely, disperses more quickly when crushed)</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Clopidogrel 75mg in 5ml oral solution (unlicensed but price controlled.)</p>
<i>Cholecalciferol</i>	See Colecalciferol
<i>Co-amilofruse</i>	<p>Consider licensed Furosemide oral solution 20mg/5ml, 40mg/5ml or 50mg/5ml and add in separate licensed Amiloride 5mg/5ml oral solution sugar free if necessary.</p> <p>or</p> <p>Prescribe Co-amilofruse tablets and label 'crush tablet and disperse in water and take...'¹</p>
<i>Co-amilozide</i>	Prescribe Co-amilozide tablets and label 'crush tablet and disperse in water and take...' ¹
<i>Co-beneldopa</i>	<p>Prescribe licensed</p> <p>Co-beneldopa 12.5mg/50mg dispersible tablets sugar free (Madopar®)</p> <p>Or</p> <p>Co-beneldopa 25mg/100mg dispersible tablets sugar free (Madopar®)</p> <p>Or</p> <p>Madopar® immediate-release capsules can be opened and the contents mixed with water or soft food. The capsule contents are reported to taste bitter⁴⁵. Once opened, capsule contents should be used immediately⁴⁶ (unlicensed use).</p> <p>Note: Co-beneldopa prolonged-release capsules are NOT suitable for opening. Patients can be switched to the same total daily dose of immediate-release capsules or dispersible tablets.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Co-careldopa</i></p>	<p>Consider alternative licensed Co-beneldopa dispersible tablets (Madopar®)</p> <p>Or</p> <p>Sinemet® (co-careldopa) immediate-release tablets can be dispersed in water or mixed with soft food⁴⁵.</p> <p>Note: Co-careldopa prolonged-release tablets are NOT suitable for crushing. Patients can be switched to the same total daily dose of immediate-release tablets, or to Madopar® dispersible tablets.</p> <p>Or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Co-careldopa 25mg/100mg/5ml oral suspension (12.5mg/50mg/5ml strength also available but more expensive) (Unlicensed but price controlled)</p>
<p><i>Co-codamol</i></p>	<p>Prescribe licensed Co-codamol soluble tablets (Please note: Soluble tablets have high sodium content)</p> <p>Note: The 8/500 strength of co-codamol is now non-formulary.</p>
<p><i>Codeine</i></p>	<p>Prescribe licensed Codeine linctus 15mg/5ml also available as SF linctus.</p> <p>Note: Higher strength Codeine 25mg in 5ml oral solution also available</p> <p><u>Feeding tubes:</u></p> <p>Dilute viscous commercial syrup with water.¹</p>
<p><i>Co-dydramol</i></p>	<p>Consider alternative licensed Co-codamol soluble tablets (Please note: Soluble tablets have high sodium content)</p> <p>(Note: Licensed Dihydrocodeine 10mg/5ml oral solution now discontinued)</p>
<p><i>Colchicine</i></p>	<p>Prescribe Colchicine tablets and label 'crush tablet and disperse in water and take...'¹</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Colecalciferol</i></p>	<p>Prophylactic Vitamin D supplements are considered to be self-care treatments and are not for FP10 prescribing</p> <p><u>Licensed liquid formulations:</u></p> <p>Fultium D3® drops 3 drops contains 200 IU Colecalciferol (vitamin D₃)</p> <p>See the formulary for other formulations</p> <p>High dose formulations agreed as an option when recommended and initiated by a consultant.</p> <p><u>Licensed liquid formulations:</u></p> <p>InVita D3® 2400units/ml oral drops</p> <p>InVita D3® 25,000units/1ml oral solution 3x1 ml</p> <p><u>Licensed products containing colecalciferol also contain calcium - See Calcium with Vitamin D</u>. Please use Calcium and Vitamin D containing preparations unless there is a specific reason not to give calcium.</p>
<p><i>Colestyramine</i></p>	<p>Prescribe Colestyramine powder</p>
<p><i>Co-phenotrope</i></p>	<p>No licensed liquid formulation available</p> <p>Consider changing to Loperamide</p> <p>Or</p> <p>Prescribe Co-phenotrope tablets and label 'crush tablet, disperse in water and take...'</p>
<p><i>Cromoglycate eye drops</i></p>	<p>See Sodium cromoglycate</p>
<p><i>Cyanocobalamin</i></p>	<p>Cyanocobalamin 1mg tablets are available as a food supplement (e.g. Lamberts, Healthaid) or as a licensed product (Orobalin® 1mg tablets).</p>

Drug	Formulation Alternative / Administration Advice
<i>Cyclizine</i>	<p>No licensed liquid formulation available</p> <p><u>For nausea, vomiting, vertigo, motion sickness, labyrinthine disorders:</u> Consider licensed Promethazine HCL preparation: see Promethazine Hydrochloride</p> <p>or</p> <p>Prescribe Cyclizine tablets and label 'crush tablet, disperse in water and take...' (crushed tablets have a bitter taste and may take 5 minutes to disperse)²</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Cyclizine 50mg/5ml oral suspension (unlicensed but price controlled.)</p>
<i>Cyproterone</i>	Prescribe Cyproterone tablets and label 'disperse tablet in water and take...' ²
D	
<i>Dabigatran</i>	<p>Important – Dabigatran capsules <u>must not be opened</u> as bioavailability and therefore anticoagulant effect is increased when taken without the capsule shell.</p> <p>Consider Edoxaban, Rivaroxaban or Apixaban – see separate entries</p>
<i>Dantrolene</i>	The capsules can be opened and the contents dispersed in water or acidic fruit juice (e.g. orange) for administration. ²⁸
<i>Demeclocycline</i>	Consider alternative licensed tetracycline preparation: see Doxycycline .
<i>Desmopressin</i>	<p>Prescribe licensed Desmopressin oral lyophilisate sugar-free (sublingual tablets)</p> <p>or</p> <p>Prescribe licensed Desmopressin Acetate Nasal Spray</p> <p>or</p> <p>Prescribe licensed Desmopressin Intranasal Solution.</p> <p>See BNF for details on different strengths available and indications.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Dexamethasone</i></p>	<p>Prescribe licensed liquid formulations</p> <p>Dexamethasone 2mg/5ml sugar-free oral solution</p> <p>or</p> <p>Dexamethasone 2mg soluble tablets sugar-free</p> <p>Note – there are higher strength liquids - Dexamethasone sugar-free oral solution 10mg/5ml or 20mg/5ml but we don't recommend these in primary care due to the potential for error</p>
<p><i>Dexamethasone eye drops (Preservative-free)</i></p>	<p>Consider Eythalm® dexamethasone 0.1% preservative-free eye drops (Multidose 6ml container that can be used for 28 days once opened).</p> <p>Other options:</p> <p>Dropodex® single-dose, preservative-free 0.4ml eye drops, Dexafree® 30 x 0.4ml single dose units or Minims® Dexamethasone 20 x 0.5ml single dose units. These contain 0.1% w/v dexamethasone but may work out as more expensive depending on dose instructions.</p>
<p><i>Dexamfetamine</i></p>	<p>If liquid preparation required consider licensed Dexamfetamine 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Consider Lisdexamfetamine - see entry for Lisdexamfetamine.</p>
<p><i>Diazepam</i></p>	<p>Prescribe licensed Diazepam 2mg/5ml oral suspension or Diazepam 2mg/5ml oral solution sugar free</p> <p><u>Feeding tubes:</u></p> <p>Dilute oral solution with an equal volume of water to reduce binding to the tube. If diazepam is administered through long PVC tubes, drug loss may occur as diazepam is significantly adsorbed onto PVC. Diazepam may also contribute towards blockage of tubes²⁸.</p>
<p><i>Diclofenac</i></p>	<p>No licensed liquid formulation available. (Diclofenac Dispersible Tablets (Voltarol®) now discontinued)</p> <p>Consider either licensed Diclofenac Suppositories (Voltarol®)</p> <p>or</p> <p>Consider alternative licensed non-steroidal anti-inflammatory drug: see Ibuprofen / Meloxicam.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Digoxin</i></p>	<p>Prescribe licensed Digoxin 50micrograms/ml oral solution</p> <p>(Lanoxin PG 50micrograms/ml elixir has been discontinued)</p> <p>Bioavailability is different between tablets and liquids.^{1,7,28} Take care when switching from tablet to liquid formulations. See separate document for more details.²⁷</p> <p>Also see SPC for further details (section 5.2).</p> <p><u>Feeding tubes:</u></p> <ul style="list-style-type: none"> - Digoxin elixir has been reported to physically interact with enteral feeds. Ensure tube is flushed well before and after each dose to prevent this²⁸. - Allow a gap of two hours before and one hour after administration of enteral digoxin before administering high-fibre enteral feeds such as Jevity^{® 28,36}
<p><i>Dihydrocodeine</i></p>	<p>(Note: Licensed Dihydrocodeine 10mg/5ml oral solution now discontinued)</p> <p>Consider switch to licensed alternative – see Codeine</p>
<p><i>Diltiazem (oral)</i></p>	<p>No licensed liquid available.</p> <p>Consider prescribing as Tildiem 60mg tablets (three times daily formulation only) and label 'crush tablet and disperse in water and take...' ¹</p> <p>As bioavailability varies between agents it would be prudent if changing from a modified release formulation to 60mg tablets to start with 60mg three times a day. ¹</p> <p>(N.B. once and twice daily MR preparations should not be crushed or chewed)</p> <p>Adizem XL, Adizem SR, Dilzem SR, Dilzem XL, Slozem, Tildiem LA – capsules can be opened and contents sprinkled in water or soft food before taking. DO NOT CRUSH.¹</p> <p>or</p> <p>Consider alternative licensed calcium channel blocker - see Verapamil.</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Diltiazem 60mg/5ml oral suspension (unlicensed but price controlled.)</p>

Drug	Formulation Alternative / Administration Advice
<i>Diltiazem (topical)</i>	<p><u>For anal fissures:</u></p> <p>Prescribe licensed Glyceryl Trinitrate 0.4% rectal ointment (Rectogesic®)</p> <p>All external preparations of diltiazem are unlicensed specials and are non-formulary. Acute trust commissioned to provide full treatment course where patient deemed contraindicated to Rectogesic®.</p>
<i>Dipyridamole</i>	<p>Clopidogrel is now preferred over dipyridamole as more clinically and cost-effective.</p> <p>Current evidence only supports <u>modified release dipyridamole</u> preparations for prevention of vascular events. If m/r capsules prescribed for the prevention of stroke or TIA cannot be taken, treatment with dipyridamole should be stopped.</p> <p>Persantin® M/R Capsules now discontinued.</p> <p>Dipyridamole/aspirin capsules (Asasantin®) - capsules are modified-release and should not be opened. Patients should be converted onto the two component drugs (NB aspirin is not available in the UK in a 25mg dosage - 75mg daily would be the usual choice)²⁸</p> <p>Dipyridamole 50mg in 5ml or 200mg in 5ml suspensions available as licensed products – but only for prevention of thrombosis associated with prosthetic heart valves.</p> <p>Dipyridamole 25mg or 100mg tablets tablets may be crushed¹– but only for prevention of thrombosis associated with prosthetic heart valves.</p>
<i>Docusate</i>	<p>Licensed liquid formulations are Docusate Sodium oral solution sugar free 50mg/5ml and 12.5mg/5ml.</p>
<i>Domperidone</i>	<p>Review prescription to ensure prescribing in line with MHRA guidance.</p> <p>Prescribe licensed Domperidone 1mg/ml oral suspension sugar free</p>
<i>Donepezil</i>	<p>Prescribe licensed Donepezil orodispersible tablets sugar free (5mg or 10mg)</p> <p>or</p> <p>Prescribe Donepezil 1mg/ml oral solution sugar-free (much more expensive than orodispersible tablets)</p>
<i>Dosulepin</i>	<p><u>For depressive illness:</u></p> <p>NICE no longer recommend dosulepin - consider another antidepressant.</p> <p>Consider alternative licensed liquid tricyclic antidepressant: see Amitriptyline / Lofepramine.</p>

Drug	Formulation Alternative / Administration Advice
<i>Doxazosin</i>	<p>No licensed liquid available.</p> <p>Consider prescribing Doxazosin tablets (non-MR) and label 'disperse tablet in water and take...' ² N.B. tablets should be dispersed in de-ionised (not tap) water. Tap water contains excessive chloride ions leading to precipitation. ¹</p> <p>Modified release tablets should not be crushed. ¹ When converting MR to plain, halve the dose and titrate upwards according to response. ²</p> <p>or</p> <p>Unlicensed specials are listed in the drug tariff. Most cost-effective formulation of a special is Doxazosin 4mg/5ml oral solution</p>
<i>Doxepin</i>	<p>For depressive illness:</p> <p>Consider alternative licensed liquid tricyclic antidepressant: see Amitriptyline / Lofepramine.</p>
<i>Doxycycline</i>	<p>Prescribe licensed Doxycycline Dispersible Tablets 100mg (Vibramycin-D[®])</p> <p><u>Feeding tube:</u></p> <p>Absorption and serum levels of doxycycline have been shown to decrease if taken with milk. Withhold enteral feeds for two hours before and one hour after each dose²⁸.</p>
E	
<i>Edoxaban</i>	<p>Edoxaban (Lixiana[®]) tablets may be crushed and mixed with water or apple puree and immediately administered orally. Lixiana[®] tablets are licensed to be administered in this way.⁴³</p> <p><u>Feeding tubes:</u></p> <p>Lixiana[®] tablets may be crushed and suspended in a small amount of water and immediately delivered through a gastric tube after which it should be flushed with water. Lixiana[®] tablets are licensed to be administered in this way.⁴³</p> <p>Crushed Lixiana tablets are stable in water and apple puree for up to 4 hours. ⁴³</p>

Drug	Formulation Alternative / Administration Advice
<i>Enalapril</i>	<p>No licensed liquid formulation available.</p> <p>Consider changing to licensed</p> <p>Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Ramipril 2.5mg/5ml oral solution sugar free</p> <p>or</p> <p>Prescribe Enalapril tablets and label 'disperse tablet in water and take...'¹</p>
<i>Entacapone</i>	<p>No licensed liquid formulation available.</p> <p>Prescribe Entacapone tablets and label 'disperse tablet in water and take...'</p> <p>N.B. will partially disperse in water and can be added to jam, honey or orange juice.</p> <p>May stain orange.</p> <p>Should be administered at the same time as levodopa/decarboxylase dose.¹</p>
<i>Entacapone/levodopa/carbidopa (Stalevo®)</i>	<p>Consider switching to separate components</p> <p>or</p> <p>The tablets can be crushed and mixed with water for administration.</p> <p>The tablets can be crushed and mixed with honey, jam, or orange juice for administration. They have a bitter taste²⁸.</p> <p>Will stain skin, teeth, tongue or tube.</p>
<i>Ephedrine Drops (nasal congestion)</i>	<p>Prescribe licensed Ephedrine Nasal Drops: 0.5% / 1%</p>
<i>Eprosartan</i>	<p>No licensed liquid formulation available.</p> <p>Consider changing to licensed</p> <p>Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Ramipril 2.5mg/5ml oral solution sugar free</p>

Drug	Formulation Alternative / Administration Advice
<i>Ergocalciferol</i>	See 'Colecalciferol'
<i>Ertugliflozin</i>	<p>No liquid formulation available</p> <p>Steglatro® SPC states: should be taken orally once daily in the morning, with or without food. In case of swallowing difficulties, the tablet could be broken or crushed as it is an immediate-release dosage form.</p>
<i>Escitalopram</i>	<p>Prescribe as licensed Escitalopram 20mg/ml drops (Cipralextm)</p> <p>Each drop contains 1mg escitalopram. Can be mixed with water or apple juice or orange juice.</p> <p>Consider alternative licensed selective serotonin re-uptake inhibitors: see Citalopram / Fluoxetine / Paroxetine.</p>
<i>Esomeprazole</i>	<p>Consider licensed Lansoprazole orodispersible tablets or Omeprazole dispersible tablets (Mezzopramtm).</p> <p>or</p> <p>Prescribe licensed Nexiumtm Esomeprazole 10mg gastro-resistant granules sachets. Contents are mixed in 15ml water (N.B not licensed for use in children <1 year old)</p> <p>or</p> <p>Prescribe Emozultm capsules or Ventratm Capsules (available as 20mg and 40mg esomeprazole capsules.) The capsules should not be chewed or crushed. However, the capsules can be opened and the pellets mixed with half a glass of non-carbonated water and the liquid swallowed within 30 minutes. Alternatively, the contents of the capsules can be mixed with water and administered via an appropriate tube.^{15,16}</p>
<i>Ethambutol</i>	<p>No licensed liquid formulation available</p> <p>Prescribe Ethambutol tablets and label 'crush tablet, mix with water and take...'¹</p>
<i>Ethosuximide</i>	<p>Licensed liquid formulation available – prescribe as Emeside® (Ethosuximide) 250mg/5ml syrup (most cost-effective option).</p>
<i>Etodolac</i>	<p>No licensed liquid formulation available</p> <p>Do not crush modified release formulations of etodolac.¹ No data available about etodolac capsules.</p> <p>Consider alternative licensed non-steroidal anti-inflammatory drug: see Ibuprofen / Meloxicam.</p>

Drug	Formulation Alternative / Administration Advice
<i>Etoricoxib</i>	Consider alternative licensed non-steroidal anti-inflammatory drug: see Ibuprofen / Meloxicam .
<i>Ezetimibe</i>	<p>No licensed liquid formulation available</p> <p>Consider age of patient and if still clinically appropriate</p> <p>Prescribe Ezetimibe tablets and label 'crush tablet, mix with water and take...'¹ (May take 5 minutes for the tablet to disperse in water)</p> <p>Please note: Not suitable for administration via enteral feeding tubes as excipients do not mix well with water.²⁸</p>
F	
<i>Famciclovir</i>	<p>Consider a switch to aciclovir as licensed Aciclovir dispersible tablets.</p> <p>or</p> <p>Licensed Aciclovir suspension sugar free 200mg/5ml or 400mg/5ml</p>
<i>Felodipine</i>	<p>MR tablets should not be crushed:¹</p> <p>Consider alternative licensed calcium channel blocker: see Verapamil or Amlodipine</p> <p>or</p> <p>Consider unlicensed alternatives see Diltiazem</p>
<i>Ferrous Fumarate</i>	<p>Prescribe licensed Ferrous Fumarate 140mg (45mg iron) /5ml oral solution</p> <p>or</p> <p>Prescribe licensed Ferrous Fumarate 140mg (45mg iron) /5ml syrup (Galfer®)</p> <p>N.B. Ferrous sulphate 200mg = ferrous fumarate 7ml (140mg/5ml) syrup</p>
<i>Ferrous Sulphate</i>	Convert to licensed ferrous fumarate preparation
<i>Fidaxomicin</i>	<p>Please refer to Specialist Pharmacy Service guidance:</p> <p>Choosing between oral fidaxomicin options – SPS - Specialist Pharmacy Service – The first stop for professional medicines advice</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Finasteride</i></p>	<p>DO NOT crush</p> <p>Place the tablet in the barrel of an oral or enteral syringe. Draw 10 – 15ml water up into the syringe and allow the tablet to disperse (in order to minimise carer contact with the medication).</p> <p>If giving via enteral feeding tube, flush well after each dose as the drug is insoluble.</p> <p>NB. Women who are or who may become pregnant should not handle crushed, broken, or dissolved tablets. Protective gloves should be worn when handling. A closed system should be used, such as the barrel of a syringe²⁸.</p>
<p><i>Flecainide</i></p>	<p>No licensed liquid formulation available</p> <p>Flecainide tablets can be crushed and dispersed in de-ionised water for administration e.g. water for injection, water for irrigation. Do not use tap water.²⁸</p> <p>or</p> <p>Unlicensed specials are listed in the Drug Tariff. Most cost-effective formulation of a special is Flecainide 25mg/5ml oral suspension.</p>
<p><i>Fluconazole</i></p>	<p>Licensed liquid formulation is Fluconazole oral suspension 50mg/5ml or 200mg/5ml</p>
<p><i>Fludrocortisone</i></p>	<p>No licensed liquid formulation available.</p> <p>Prescribe Fludrocortisone tablets and label 'dissolve tablet in water and take...'</p> <p>Crushed tablets can also be mixed in a small amount of soft food such as yogurt, jam or mashed potato. ²³</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Fludrocortisone oral suspension 50micrograms/5ml or 100micrograms/5ml. (Very expensive, unlicensed but price controlled if liquid is necessary.)</p>
<p><i>Fluoxetine</i></p>	<p>Prescribe licensed Fluoxetine 20mg/5ml oral solution or licensed Olena® 20mg dispersible tablet (Fluoxetine Hydrochloride).</p> <p>If a 10mg fluoxetine dose is required it is more cost effective to prescribe Olena® 20mg dispersible tablets. These are scored and can be halved to give a 10mg dose. Fluoxetine 10mg capsules are very expensive.</p>
<p><i>Fluvoxamine</i></p>	<p>Consider alternative licensed selective serotonin re-uptake inhibitors: see Citalopram / Fluoxetine / Paroxetine</p>

Drug	Formulation Alternative / Administration Advice
<i>Folic Acid</i>	Licensed liquid formulations are Folic acid 2.5mg/5ml oral solution sugar free and Folic acid 5mg/5ml oral solution sugar free
<i>Fosinopril</i>	Consider changing to licensed alternative: Lisinopril 5mg/5ml oral solution sugar free or Ramipril 2.5mg/5ml oral solution
<i>Furosemide</i>	Licensed liquid formulation is Furosemide oral solution sugar free 20mg/5ml or 40mg/5ml or 50mg/5ml . Frusol® brand (Rosemont) costs slightly less than the Drug Tariff price.
G	
<i>Gabapentin</i>	Licensed liquid formulation is Gabapentin 50mg/ml oral solution sugar free . Some oral solutions are licensed for administration via NG or PEG tube. Warning: excipients of the Rosemont formulation include propylene glycol, acesulfane and saccharin sodium and may exceed WHO limits when large doses of the liquid are required. ¹ Also contains parahydroxybenzoates (may cause allergic reactions (possibly delayed), potassium - 3.8mg per 1ml dose (this should be taken into consideration for patients with reduced kidney function or patients on controlled potassium diets) and sodium - 0.72mg per 1ml dose. or Prescribe Gabapentin capsules and label 'open capsule and dissolve the contents in water and take immediately...' ¹ (N.B. caution advised on this unlicensed route in patients with epilepsy.)
<i>Galantamine</i>	Licensed liquid formulation is Galantamine 20mg/5ml oral solution sugar free but this is very expensive. Prescribe as Galzemic® brand (more cost-effective than generic). Consider changing to Donepezil orodispersible tablets sugar free or Alzest® Rivastigmine patches

Drug	Formulation Alternative / Administration Advice
<i>Glibenclamide</i>	<p>No licensed liquid formulation available</p> <p>Consider a switch to shorter acting Gliclazide (non-MR) tablets</p> <p>or</p> <p>Prescribe Glibenclamide tablets and label 'disperse tablet in water and take immediately...' ²⁸</p>
<i>Gliclazide</i>	<p>Prescribe Gliclazide tablets (non-MR) and label as 'Crush tablet well and disperse in water or orange juice²⁸ and take immediately...' ¹</p> <p>(Gliclazide is practically insoluble so must be crushed well²⁸)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>30mg modified release gliclazide equivalent to 80mg standard gliclazide tablet.</p> <p>Switching from modified release to standard gliclazide should be done with careful drug monitoring.²⁸</p> </div> <p>It may be advisable to monitor blood glucose in any patient when altering the formulation / crushing the tablets.</p> <p>Unlicensed specials listed in the Drug Tariff are Gliclazide 40mg/5ml oral suspension and Gliclazide 80mg/5ml oral suspension.</p>
<i>Glimepiride</i>	<p>Consider a switch to Gliclazide (non-MR) tablets</p> <p>Do not crush the tablets as this may affect their bioavailability</p>
<i>Glipizide</i>	<p>Consider a switch to Gliclazide (non-MR) tablets</p> <p>or</p> <p>Prescribe Glipizide tablets and label 'crush tablet, mix with water and take...'</p>
<i>Glyceryl Trinitrate (topical)</i>	<p>For anal fissures:</p> <p>Prescribe licensed Glyceryl Trinitrate 0.4% rectal ointment (Rectogesic®)</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Glycopyrronium</i></p>	<p>Licensed Glycopyrronium 1mg tablets and 2mg tablets are available but are very expensive.</p> <p><u>Licensed liquid formulations:</u></p> <p>Glycopyrronium bromide 400micrograms/ml oral solution sugar free (contains 320micrograms/ml of glycopyrronium)</p> <p>Glycopyrronium bromide 1mg/5ml oral solution sugar free</p> <p>Both are licensed for symptomatic treatment of severe sialorrhoea (chronic pathological drooling) in children and adolescents aged 3 years and older with chronic neurological disorders.</p> <p>Drug Tariff Part VIII B lists unlicensed liquid formulations with NHS prices that may be more cost effective, particularly when higher doses are required.</p> <p><u>Unlicensed liquid formulations listed in Drug Tariff:</u></p> <p>Glycopyrronium bromide oral suspension 200micrograms/5ml, 500micrograms/5ml, 2.5mg/5ml, 5mg/5ml</p> <p>Glycopyrronium bromide oral solution 200micrograms/5ml, 500micrograms/5ml, 2.5mg/5ml, 5mg/5ml</p> <p>Compare costs if prescribing. Liquid formulation prices vary depending on strength and quantity. Note the drug tariff payment is for a minimum quantity with additional costs above this minimum)</p> <p>Consider Hyoscine Hydrobromide as an alternative.</p>
<p><i>Griseofulvin</i></p>	<p>For fungal infections trial licensed topical preparation first - see formulary for current recommendations. No licensed liquid oral formulation of griseofulvin available.</p>
<p>H</p>	
<p><i>Haloperidol</i></p>	<p>Prescribe licensed</p> <p>Haloperidol 10mg/5ml oral solution sugar free</p> <p>or</p> <p>Haloperidol 5mg/5ml oral solution sugar free</p>
<p><i>Hydralazine</i></p>	<p>No licensed liquid formulation available, please consider a change in treatment</p>

Drug	Formulation Alternative / Administration Advice
<i>Hydrocortisone</i>	<p>No licensed liquid available.</p> <p>Prescribe Hydrocortisone tablets and label 'disperse tablet in water to form a suspension and take immediately...'¹</p> <p>Do not crush or disperse modified release formulations.</p> <p>Unlicensed specials listed in the Drug Tariff are Hydrocortisone 10mg/5ml oral suspension and Hydrocortisone 5mg/5ml oral suspension.</p>
<i>Hydroxycarbamide (Hydroxyurea)</i>	<p>Cytotoxic Drug: should not be crushed/ dissolved in primary care.</p> <p>Licensed liquid formulation available Xromi® Hydroxycarbamide 100mg in 1ml oral suspension.</p>
<i>Hyoscine Butylbromide</i>	<p><u>Low systemic absorption – predominantly has local effects on the gut.</u></p> <p>No licensed liquid formulation available.</p> <p>Do not crush the tablets²⁸.</p> <p>Unlicensed special listed in Drug Tariff Hyoscine Butylbromide 10mg/5ml oral suspension (oral solution also available but is more expensive).</p> <p><u>Feeding tube:</u></p> <p>If an enteral feeding tube is in place the contents of the injection can be given via enteral tube. Do not give crushed tablet as this could block the tube. No information available on administering the special suspension via enteral feeding tubes²⁸.</p>
<i>Hyoscine Hydrobromide</i>	<p><u>Readily absorbed from GI tract or the skin</u></p> <p>Prescribe Hyoscine patch (Scopoderm® TTS) or Kwells Kids 150 microgram chewable tablets</p>
<i>Hypromellose Eye Drops (Preservative-free)</i>	<p>Several licensed formulations now available in single use packs or in 10ml bottles. Formulary recommendation is Evolve Hypromellose 0.3% preservative-free 1 x10ml. No advantage prescribing strengths other than licensed 0.3%w/v¹⁰</p>
<p>I</p>	

Drug	Formulation Alternative / Administration Advice
<i>Ibandronate</i>	<p>No licensed liquid formulation available</p> <p>If liquid formulation required consider either:</p> <p>Licensed Alendronic acid oral solution sugar free 70mg/100ml</p> <p>or</p> <p>Alendronic acid 70mg effervescent tablet (Binosto®) dissolved in at least 120ml water</p> <p>or</p> <p>Consider Denosumab (Prolia®) 60mg/1ml solution for injection pre-filled syringe</p>
<i>Ibuprofen</i>	<p>Licensed liquid formulations are:</p> <p>Ibuprofen 100mg/5ml oral suspension sugar free</p> <p>or</p> <p>Ibuprofen 100mg/5ml oral suspension</p> <p>or</p> <p>Ibuprofen 600mg/sachet effervescent granules – however contains 6.5mmol sodium per sachets.</p>
<i>Imipramine HCL</i>	<p>Prescribe licensed Imipramine 25mg/5ml oral solution sugar free</p>
<i>Indapamide</i>	<p>No licensed liquid formulation available</p> <p>Conventional release Indapamide tablets (not M/R) can be dispersed in water immediately prior to administration ^{1,28}</p>
<i>Indometacin</i>	<p>No licensed liquid formulation available</p> <p>Prescribe licensed Indometacin 100mg Suppositories</p> <p>or</p> <p>Consider alternative licensed non-steroidal anti-inflammatory drug - see Ibuprofen / Meloxicam.</p> <p>or</p> <p>Unlicensed special listed in the Drug Tariff Indometacin 25mg/5ml oral suspension</p>

Drug	Formulation Alternative / Administration Advice
<i>Indoramin</i>	Indoramin tablets can be dispersed in water before taking. ²⁸
<i>Irbesartan</i>	<p>No licensed liquid formulation available.</p> <p>Consider licensed Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Licensed Ramipril 2.5mg/5ml oral solution sugar free</p> <p>or</p> <p>Prescribe Irbesartan tablets and label ' crush tablet, disperse in water and take...'²⁸</p>
<i>Iron preparations</i>	<p>Convert to licensed ferrous fumarate preparations:</p> <p>Prescribe licensed Ferrous Fumarate 140mg (45mg iron) /5ml oral solution</p> <p>or</p> <p>Prescribe licensed Ferrous Fumarate 140mg (45mg iron) /5ml syrup (Galfer®)</p> <p>N.B. Ferrous sulphate 200mg = ferrous fumarate 7ml (140mg/5ml) syrup</p>
<i>Isoniazid</i>	<p>No licensed liquid formulation available.</p> <p>Isoniazid 50mg and 100mg tablets can be crushed and dispersed in water.^{1,28}</p> <p>Unlicensed liquid formulation listed in the Drug Tariff is Isoniazid 50mg/5ml oral solution</p>
<i>Isosorbide Dinitrate</i>	<p>No licensed liquid formulation available.</p> <p>Consider using licensed Glyceryl trinitrate patches.¹</p>
<i>Isosorbide Mononitrate</i>	<p>No licensed liquid formulation available.</p> <p>Do not crush modified release formulations.¹</p> <p>Consider using licensed Glyceryl trinitrate patches.¹</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff.</p> <p>Prescribe Isosorbide mononitrate 20mg/5ml oral suspension</p>

Drug	Formulation Alternative / Administration Advice
L	
<i>Labetalol</i>	<p>No licensed liquid formulation available.</p> <p>Consider alternative licensed beta-blocker preparation: see Atenolol / Propranolol</p> <p>or</p> <p>Injection may be taken orally or enterally if necessary – it has a bitter taste which may be masked using fruit juice¹:</p>
<i>Lacidipine</i>	Consider alternative licensed calcium channel blocker: see Amlodipine .
<i>Lamotrigine</i>	Prescribe licensed Lamotrigine dispersible tablets .
<i>Lansoprazole</i>	<p>Prescribe licensed Lansoprazole orodispersible tablets</p> <p>or</p> <p>Consider alternative licensed Omeprazole dispersible tablets (Mezzopram®)</p> <p>or</p> <p>Licensed Nexium® Esomeprazole 10mg gastro-resistant granules sachets. Contents are mixed in 15ml water (N.B not licensed for use in children <1 year old)</p> <p>or</p> <p>Licensed Emozul® capsules or Ventra® Capsules (available as 20mg and 40mg esomeprazole capsules.) The capsules should not be chewed or crushed. However, the capsules can be opened and the pellets mixed with half a glass of non-carbonated water and the liquid swallowed within 30 minutes. Alternatively, the contents of the capsules can be mixed with water and administered via an appropriate tube.^{15,16}</p>
<i>Levetiracetam</i>	<p>Prescribe licensed Levetiracetam 100mg/ml oral solution sugar free</p> <p>Or</p> <p>Desitrend® (levetiracetam) granules sachets – available as 250mg, 500mg or 1000mg sachets</p> <p><u>Enteral feeding tube:</u></p> <p>Desitrend® is licensed to be given via feeding tube (see SmPC for further details)</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Levodopa</i></p>	<p>See under Co-beneldopa or Entacapone/levodopa/carbidopa (Stalevo®) or Co-careldopa</p>
<p><i>Levomepromazine</i></p>	<p>For palliative care doses: use the Nozinan® levomepromazine 25mg tablets - they are quarter scored and can be split to give a 6.25mg dose</p> <p>Tablets can be dispersed in water for administration if necessary. They disperse immediately²⁸.</p> <p>Or</p> <p>Use unlicensed special listed in Drug Tariff Levomepromazine 2.5mg/5ml oral suspension (The 6mg/5ml oral suspension is very expensive).</p> <p>Or</p> <p>Licensed LevoroI® levomepromazine hydrochloride 25mg/5ml oral solution sugar free (very expensive)</p> <p>Or</p> <p>Injection may be taken orally if necessary: Prescribe Levomepromazine HCL 25mg/ml injection (1ml ampoule) and label according to dose calculated. ¹</p>
<p><i>Levothyroxine</i></p>	<p>Licensed liquid formulation is Levothyroxine sodium oral solution sugar free available in strengths 25microgram/5ml, 50microgram/5ml, 100microgram/5ml and 125microgram/5ml. (Please be aware that these are high cost).</p> <p>or</p> <p>Prescribe Levothyroxine tablets and label 'crush tablet, mix with water and take...'¹</p> <p>Care should be taken to avoid third party contact. Avoid inhalation of crushed tablets.¹</p> <p>Take care when switching from tablet to liquid formulations. See separate document for more details.²⁷</p>

Drug	Formulation Alternative / Administration Advice
<i>Lidocaine</i>	<p>For surface anaesthesia.</p> <p>Formulary choices are:</p> <p>Ametop® gel (tetracaine 4%)</p> <p>or</p> <p>Lidocaine 5% ointment</p> <p>or</p> <p>EMLA® cream (lidocaine 2.5% / prilocaine 2.5%)</p>
<i>Lidocaine Patches</i>	<p>For pain relief</p> <p>Ralvo® 700mg Lidocaine medicated plasters is the CCG preferred brand.</p> <p>Limited to use in post herpetic neuralgia only.</p>
<i>Lisinopril</i>	<p>Licensed liquid formulation is Lisinopril 5mg/5ml oral solution sugar free.</p> <p>Lisinopril tablets will disperse in water but are an unlicensed option.</p> <p>Unlicensed special listed in the Drug Tariff is Lisinopril 20mg in 5ml oral solution (suspension also available but costs more than solution).</p>
<i>Lisdexamfetamine</i>	<p>If liquid preparation required please discuss the option of using lisdexamfetamine dimesylate (Elvanse®) with secondary care (AMBER in Traffic Light Scheme)</p> <p>Elvanse® capsules may be swallowed whole, or the capsule opened and the entire contents emptied and mixed with a soft food such as yogurt or in a glass of water or orange juice. If the contents include any compacted powder, a spoon may be used to break apart the powder in the soft food or liquid. The contents should be stirred until completely dispersed. The patient should consume the entire mixture of soft food or liquid immediately; it should not be stored. The active ingredient dissolves completely once dispersed; however, a film containing the inactive ingredients may remain in the glass or container once the mixture is consumed. The patient should not take anything less than one capsule per day and a single capsule should not be divided.⁶</p> <p>Elvanse® is indicated as part of a comprehensive treatment programme for attention deficit/hyperactivity disorder (ADHD) in children aged 6 years of age and over, when response to previous methylphenidate treatment is considered clinically inadequate.⁶</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Lithium</i></p>	<p>Do not crush or dissolve tablets</p> <p>Licensed liquid formulations are:</p> <p>Li-Liquid® Lithium Citrate 509mg/5ml oral solution 509mg/5mL (Li⁺ 5.4mmol/5mL)</p> <p>Li-Liquid® Lithium Citrate 1.018g/5mL oral solution (Li⁺ 10.8mmol/5mL)</p> <p>or</p> <p>Priadel® Lithium Citrate 520mg/5mL liquid (Li⁺ 5.4mmol/5mL)</p> <p>N.B. Preparations vary widely in bioavailability, changing the preparation requires the same precautions as initiation of treatment. Lithium citrate tetrahydrate 509mg is equivalent to lithium carbonate 200mg. See separate document for more details.²⁷</p> <p>N.B. Prescribe by brand name.</p> <p><u>Feeding tubes:</u> Lithium absorption is decreased in the presence of enteral feeds. Feeds should be withheld for one hour before and two hours after each dose.²⁸</p>
<p><i>Lofepamine</i></p>	<p>Licensed liquid formulation is Lofepamine 70mg/5ml oral suspension sugar free</p>
<p><i>Loperamide</i></p>	<p>Licensed liquid formulation is: Loperamide 1mg/5ml oral solution sugar free</p> <p>(Imodium Instant Melts® are orodispersible tablets but cost much more per dose than the liquid.)</p>
<p><i>Loprazolam</i></p>	<p>No licensed liquid formulation available</p> <p>For short term use only / if still appropriate: Loprazolam tablets will disperse in water.²⁸</p> <p>Consider alternative licensed hypnotic see: Temazepam or consider licensed zolpidem tablets which can be crushed and dispersed in water (unlicensed administration).¹</p>
<p><i>Lorazepam</i></p>	<p>For short term use only / if still appropriate:</p> <p>Consider alternative licensed anxiolytic - see Diazepam</p> <p>or</p> <p>Prescribe Lorazepam tablets and label 'crush tablet, mix with water and take...'</p> <p>Lorazepam tablets can also be used sublingually.^{1,28}</p>

Drug	Formulation Alternative / Administration Advice
<i>Lormetazepam</i>	<p>For short term use only / if still appropriate:</p> <p>Consider alternative licensed hypnotic see: Temazepam or consider licensed zolpidem tablets which can be crushed and dispersed in water (unlicensed administration).¹</p>
<i>Losartan</i>	<p>(Cozaar® licensed liquid formulation is discontinued)</p> <p>Consider either:</p> <p>Licensed Losartan tablets which can be crushed and dispersed in water before taking²⁸</p> <p>or</p> <p>Unlicensed special listed in Drug Tariff is Losartan 50mg/5ml oral suspension</p>
M	
<i>Magnesium supplements</i>	<p>Many magnesium formulations are only available as expensive unlicensed specials.</p> <p>Licensed options for patients unable to swallow tablets or capsules include: Mucogel® Suspension – at a dose of 10-20ml tds & at bedtime. This will provide equivalent magnesium intake required for hypomagnesaemia as an alternative to magnesium glycerophosphate.</p> <p>or</p> <p>Magnaspartate® 243mg (10mmol magnesium) oral powder sachets Licensed for the treatment and prevention of magnesium deficiency in adults and children aged 2 years and above. Most cost-effective formulation but specify brand name.</p> <p>or</p> <p>Licensed magnesium glycerophosphate preps available are:</p> <p>Neomag® 97mg (4mmol) chewable sugar-free tablets MagnaPhos® 97.2mg (4mmol) chewable sugar-free tablets MagnaPhos® 97.2mg (4mmol) capsules or 48.6mg (2mmol) capsules MagnaPhos® 121.25mg/5ml (5mmol in 5ml) oral solution</p> <p>The MagnaPhate® chewable tablet (previous recommendation) has a comparable NHS price but is licensed as a food supplement not a medicine.</p>

Drug	Formulation Alternative / Administration Advice
<i>Mebeverine</i>	<p>Licensed liquid formulation is Mebeverine 50mg/5ml oral suspension sugar free (very expensive)</p> <p>Colofac® tablets can be crushed and mixed with water before taking although unpleasant taste.¹ Do not crush the MR formulations.</p> <p>If a bulk-forming laxative is also needed, consider Fybogel Mebeverine® effervescent granules sachet. One sachet contains 3.5mg ispaghula husk and 135mg mebeverine. (These are not suitable for administration via an enteral feeding tube.)</p> <p>Please note that licensed doses differ between formulations. Please consult the product literature.</p>
<i>Medroxyprogesterone</i>	<p>No licensed liquid formulation.</p> <p>Licensed Medroxyprogesterone tablets can be crushed (preferably in water to reduce dust production) and mixed with water for administration. Without crushing they disperse in one to five minutes. Use immediately.²⁸ (Unlicensed administration).</p>
<i>Mefenamic Acid</i>	<p>Licensed liquid formulation is Mefenamic acid 50mg/5ml oral suspension (very expensive). The strength of the suspension is such that most adult doses would require large volumes. It is recommended that patients are switched to an alternative drug.</p> <p>Consider alternative licensed non-steroidal anti-inflammatory drug - see Ibuprofen / Meloxicam.</p>
<i>Megestrol acetate</i>	<p>Licensed Megestrol acetate tablets can be dispersed in water for administration²⁸</p> <p>N.B. Can take five minutes for tablet to completely disperse.</p> <p>Please note – may block enteral feeding tubes</p>
<i>Melatonin</i>	<p>Only licensed formulation is Circadin® 2mg modified release tablet. Licensed for the short term treatment of insomnia in adults over 55. Circadin® tablets must be swallowed whole.</p> <p>Use of melatonin for other indications - please refer to the Traffic Light document</p>

Drug	Formulation Alternative / Administration Advice
<i>Meloxicam</i>	<p>No licensed liquid formulation available.</p> <p>Consider licensed Meloxicam orodispersible tablets sugar free</p> <p>or</p> <p>Consider alternative licensed non-steroidal anti-inflammatory drug</p> <p>NB Meloxicam suppositories are discontinued.</p>
<i>Memantine</i>	<p>Licensed formulations are:</p> <p>Valios® 5mg, 10mg, 15mg or 20mg orodispersible tablets (Alzhok® brand now discontinued)</p> <p>or</p> <p>Memantine 10mg/ml oral solution sugar free (Please check prices as price difference will vary between orodispersible tablets and liquid.)</p>
<i>Menthol in Aqueous Cream</i>	<p>Licensed formulations are Arjun® cream (0.5%, 1% and 2%) Dermacool® (0.5%, 1%, 2% and 5%) and AquaSoothe® (1% and 2%)</p> <p>Prescribe by brand to avoid unlicensed products being supplied.</p>
<i>Mercaptopurine 10mg</i> <i>(50mg tablets are licensed)</i>	<p>Cytotoxic Drug: tablets should not be crushed/ dissolved in primary care</p> <p>Licensed liquid formulation available as Mercaptopurine 20mg/ml suspension (Xaluprine®)</p> <p>Comes with two syringes. The 1ml graduated syringe allows dose increments of 0.1ml to be measured. The 5ml syringe allows 0.2ml dose increments.</p> <p>Take care when switching from tablet to liquid formulations. See separate document for more details.²⁷</p> <p>See Traffic Light document - only prescribe for AMBER indications.</p> <p>Mercaptopurine is a RED drug when used for treatment of cancer.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Mesalazine</i></p>	<p>The delivery characteristics of oral mesalazine preparations may vary. For patients who are not able to swallow tablets or capsules, consider:</p> <p>Salofalk® gastro-resistant prolonged-release granules (500g, 1g, 1.5g or 3g)</p> <p>The contents of the sachets of Salofalk® granules should not be chewed. The granules should be taken on the tongue and swallowed, without chewing, with plenty of liquid.</p> <p>or</p> <p>Pentasa® Sachet prolonged release granules (1g, 2g, or 4g)</p> <p>Granules should be placed on tongue and washed down with water or orange juice without chewing. Granules are modified release and will contain small particles so may not be suitable for enteral feeding tubes.¹</p>
<p><i>Metformin</i></p>	<p>Licensed liquid formulations are:</p> <p>Metformin 500mg oral powder sachets sugar free (Morningside Healthcare Ltd) – most cost-effective option</p> <p>or</p> <p>Metformin oral solution sugar free 500mg/5ml, 850mg/5ml and 1g/5ml</p>
<p><i>Methadone</i></p>	<p>Licensed formulations of 1mg/1ml solution include generic preparations and branded Physeptone®. The green colour in methadone mixture is often E142 a dye found in desserts, gravy granules, ice cream, mint sauce, sweets, packet breadcrumbs, cake mixes and tinned peas.</p> <p>If for any reason patients cannot have E142, the Rosemont brand of methadone mixture (Metharose®) is a sugar-free 1mg/ml strength which is brown – this colour is from caramel only.</p>
<p><i>Methotrexate</i></p>	<p>Cytotoxic Drug: tablets should not be crushed/ dissolved in primary care.</p> <p>Licensed liquid formulation is Methotrexate 2mg/ml oral solution sugar free</p>
<p><i>Methenamine</i></p>	<p>Methenamine hippurate (Hiprex®) tablets can be halved or crushed and taken with a drink of milk or fruit juice.²²</p>
<p><i>Methylprednisolone</i></p>	<p>Methylprednisolone tablets can be dispersed in water for administration. They disperse within one minute.²⁸</p> <p>or</p> <p>Consider licensed Dexamethasone sugar-free oral solution 2mg/5ml (Dexsol®)</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Methylphenidate</i></p>	<p>Immediate release formulations Medikinet® and Ritalin® tablets can be crushed and mixed with a small amount of soft food such as yogurt, honey or jam and then swallowed straight away, without chewing²³.</p> <p>Methylphenidate XL (modified-release) tablets should not be crushed.</p> <p>Methylphenidate XL (modified-release) capsules:</p> <p>Equasym XL® capsules may be opened, and the capsule contents sprinkled onto a small amount (tablespoon) of apple sauce and given immediately, and not stored for future use. Drinking some fluids, e.g. water, should follow the intake of the sprinkles with apple sauce. The capsules and the capsule contents must not be crushed or chewed.²⁹</p> <p>Ritalin XL® capsules may be carefully opened and the beads sprinkled over soft food (e.g. apple sauce, jam, spread, yoghurt). The food should not be warm because this could affect the prolonged-release properties of this formulation. The mixture of drug and food should be consumed immediately in its entirety. The drug and food mixture should not be stored for future use.⁴⁰</p> <p>If liquid preparation required please discuss the option of using licensed lisdexamfetamine dimesylate (Elvanse®) with secondary care (AMBER in Traffic Light Scheme)</p>
<p><i>Metoclopramide</i></p>	<p>Licensed liquid formulation is Metoclopramide 5mg/5ml oral solution sugar free</p>
<p><i>Metolazone</i></p>	<p>Licensed Metolazone 5mg tablets are now available as Xaqua®.</p> <p>Important note: Xaqua® tablets bioavailability may be different from other metolazone preparations (see SmPC for further details)⁴⁷ See MHRA alert</p> <p>Metolazone tablets are formulary for consultant recommendation (AMBER drug in the Traffic Lights Guidance for treatment of heart failure on a named patient basis after initiation by a consultant cardiologist when indapamide and bendroflumethiazide have failed or are contra-indicated).</p> <p>Metolazone tablets can be crushed and dispersed in water for patients unable to swallow tablets²⁸.</p> <p>No licensed liquid formulation available.</p>
<p><i>Metoprolol</i></p>	<p>Consider alternative licensed beta-blocker preparation: see Atenolol / Propranolol.</p> <p>Unlicensed specials listed in the Drug Tariff are Metoprolol 12.5mg/5ml oral suspension, 12.5mg/5ml oral solution (more expensive) and 50mg/5ml oral solution.</p>

Drug	Formulation Alternative / Administration Advice
<i>Midazolam (oral)</i>	<p>Licensed products:</p> <p>Buccolam® oromucosal solution 10mg/2ml prefilled oral syringes – various dose sizes available</p> <p>Epistatus® oromucosal solution 10mg/1ml prefilled oral syringes (note – these are a different strength to Buccolam®)</p> <p>Prescribe by brand for patient/carer continuity so the product is the same each time.</p>
<i>Minocycline</i>	<p>Consider alternative licensed tetracycline preparation: see Doxycycline.</p>
<i>Mirtazepine</i>	<p>Prescribe licensed:</p> <p>Mirtazepine orodispersible tablets - available as 15mg, 30mg and 45mg</p> <p>or</p> <p>Licensed liquid formulation is Mirtazapine 15mg/ml oral solution sugar free (more expensive than orodispersible tablets)</p>
<i>Misoprostol</i>	<p>Consider an alternative licensed therapy: see Ranitidine / Lansoprazole / Omeprazole</p>
<i>Montelukast</i>	<p>Prescribe Montelukast chewable tablets sugar free</p> <p>These may be chewed or dispersed in water. ^{2,28}</p> <p>Montelukast granules may be swallowed or mixed with cold, soft food (not liquid) and taken immediately. ³</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Morphine Sulphate</i></p> <p><i>(Controlled Drug)</i></p>	<p>Prescribe licensed Morphine sulphate 10mg/5ml oral solution (Oramorph®)</p> <p>Or</p> <p>Actimorph® orodispersible tablets (1mg, 2.5mg, 5mg, 10mg, 20mg & 30mg)</p> <p>(A higher strength 20mg/ml concentrated oral solution is also available but please take care due to risk of accidental overdose with this higher strength formulation.)</p> <p>Modified release formulations: For patients who are unable to swallow capsules or tablets consider:</p> <p>Zomorph® capsules - The contents of the capsule can be administered directly in semi-solid food (puree, jam, yoghurt) or via gastric or gastrostomy tubes of a diameter of more than 16 F.G. with an open distal end or lateral pores. It is sufficient to rinse the tube with 30ml to 50ml of water⁴¹. Do not crush contents.</p> <p>It is important to ensure that no part of the dose remains in the feeding tube, where the administration of the next drug or feed might cause an unexpected dose of morphine to be administered to the patient²⁸.</p> <p>(All strengths of MST Continus® prolonged release granules for oral suspension now discontinued.)</p> <p>See BNF chapter 'Prescribing in Palliative Care' for advice on transfer from MR to oral solution of morphine.</p>
<p><i>Moxonidine</i></p>	<p>Moxonidine tablets can be crushed finely and dispersed in water for administration.</p> <p>Without crushing they disperse in around five minutes. The manufacturer recommends crushing one tablet and mixing it in 50ml of water, then allowing it to dissolve for 2 minutes before administering.²⁸</p>
N	
<p><i>Naftidrofuryl</i></p>	<p>If administering <u>via enteral tube</u>, prescribe Naftidrofuryl capsules and label 'open capsule and disperse contents in water and give via enteral tube. Flush tube well before and after to ensure adequate hydration. ¹</p> <p>N.B. The powder is irritant and anaesthetic to the mouth and throat. There is a risk of oesophageal stricture if the capsules are opened for oral use in patients with swallowing difficulties. Review the need for this medication²⁸.</p>

Drug	Formulation Alternative / Administration Advice
<i>Naproxen</i>	<p>Consider licensed Naproxen 250mg/5ml oral suspension</p> <p>or</p> <p>Naproxen 250mg effervescent tablets (Stirlescent®) (note the tablets contain 341.89mg sodium per tablet)</p> <p>As these are both high cost NSAID formulations consider an alternative licensed non-steroidal anti-inflammatory drug: see Ibuprofen / Meloxicam.</p>
<i>Nicardipine</i>	<p>Nicardipine capsules can be opened and the contents dispersed in orange juice before taking²⁸.</p>
<i>Nicorandil</i>	<p>Prescribe Nicorandil tablets and label 'crush tablet, mix with water to form a suspension and take immediately...' Tablets may take 5 minutes to disperse.¹</p>
<i>Nifedipine</i>	<p>Consider alternative licensed calcium channel blocker: see Verapamil</p> <p>or</p> <p>Consider unlicensed alternatives see: Amlodipine / Diltiazem / Nimodipine</p> <p>or</p> <p>Modified-release capsules (e.g. Coracten XL®) can be opened and the contents flushed down enteral feeding tubes for administration.²⁸ The capsule contents should not be crushed as this will destroy their modified-release properties.</p> <p>There is no information available about oral administration of the opened capsules.</p> <p>Unlicensed special formulations listed in the Drug Tariff are Nifedipine oral suspension 10mg/5ml and 5mg/5ml</p>
<i>Nimodipine</i>	<p>Prescribe Nimodipine tablets and label 'crush tablet, mix with water and take immediately...'¹</p> <p>N.B. Solution is light sensitive hence immediate administration.</p>
<i>Nitrazepam</i>	<p>For short term use only / if still appropriate:</p> <p>Licensed Nitrazepam 2.5mg/5ml oral suspension is available but is very expensive. Consider alternative licensed hypnotic see: Temazepam or consider licensed zolpidem tablets which can be crushed and dispersed in water (unlicensed administration).¹</p>

Drug	Formulation Alternative / Administration Advice
Nirmatrelvir & ritonavir (Paxlovid®)	<p>Paxlovid ▼® (nirmatrelvir and ritonavir) tablets can be crushed or split and mixed with food or liquid, including dairy containing products immediately before administration.</p> <p>Crushed tablets mixed with water can also be considered for administration via feeding tubes (tube should be flushed with water after administration).⁴⁸</p>
Nitrofurantoin	<p>Licensed liquid formulation is Nitrofurantoin 25mg/5ml oral suspension sugar free (very expensive).</p> <p>Consider Methenamine hippurate (Hiprex®) tablets for prophylaxis and long-term treatment of chronic or recurrent lower urinary-tract infections in adults. Tablets can be halved or crushed and taken with a drink of milk or fruit juice.²²</p>
Nizatidine	Consider alternative licensed H ₂ -receptor antagonist: see Ranitidine / Cimetidine
Nortriptyline	<p>Consider alternative licensed tricyclic antidepressant: see Amitriptyline / Lofepamine</p> <p>For depressive illness: Prescribe licensed Nortriptyline 25mg/5ml oral solution sugar free (Colonis Pharma Ltd) – this is very high cost. (Licensed 10mg/5ml oral solution sugar free also available but it is more cost effective to prescribe the higher strength).</p>
O	
Olanzapine	Prescribe licensed Olanzapine orodispersible tablet sugar free
Olive Oil Eardrops	<p>Suitable for self-care – available OTC</p> <p>If prescribing, prescribe as Otadrop® olive oil eardrops 10ml</p>
Olmesartan	<p>Consider changing to licensed</p> <p>Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Ramipril 2.5mg/5ml oral solution sugar free</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Omeprazole (Adult)</i></p>	<p>Prescribe licensed Omeprazole dispersible tablets</p> <p>Mezzopram® is the cost effective brand. The tablet can be dispersed in a spoonful of non-carbonated water or mixed with some fruit juices or apple sauce. The dispersion should be taken immediately (or within 15 minutes) and always be stirred just before drinking and rinsed down with half a glass of water. DO NOT USE milk or carbonated water. The enteric-coated pellets must not be chewed. The tablets can be dispersed in non-carbonated water and administered through a gastric tube. It is important that the appropriateness of the selected syringe and tube is carefully tested²¹. See SPC for further details.</p> <p>or</p> <p>Consider alternative licensed Lansoprazole orodispersible tablet</p> <p>or</p> <p>Licensed Nexium® Esomeprazole 10mg gastro-resistant granules sachets. Contents are mixed in 15ml water</p> <p>or</p> <p>Licensed Emozul® capsules or Ventra® capsules (available as 20mg and 40mg esomeprazole capsules). The capsules should not be chewed or crushed. However, they can be opened and the pellets mixed with half a glass of non-carbonated water and the liquid swallowed within 30 minutes. Alternatively, the contents of the capsules can be mixed with water and administered via an appropriate tube.^{15,16}</p>
<p><i>Omeprazole (Paediatric)</i></p>	<p>Prescribe licensed Omeprazole dispersible tablets</p> <p>Mezzopram® is the cost effective brand and is licensed for children over 1 year of age and ≥ 10 kg. The tablet can be dispersed in a spoonful of non-carbonated water or mixed with some fruit juices or apple sauce. The dispersion should be taken immediately (or within 15 minutes) and always be stirred just before drinking and rinsed down with half a glass of water. DO NOT USE milk or carbonated water. The enteric-coated pellets must not be chewed. The tablets can be dispersed in non-carbonated water and administered through a gastric tube. It is important that the appropriateness of the selected syringe and tube is carefully tested²¹. See SPC for further details.</p> <p>or</p> <p>Licensed Nexium® Esomeprazole 10mg gastro-resistant granules sachets. Contents are mixed in 15ml water (NB Not licensed for use in children <1 year old)</p> <p>or</p> <p>Licensed Omeprazole 10mg/5ml oral suspension sugar free (Rosemont) which is licensed for children > 1 month old (more expensive than dispersible tablets)</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Ondansetron</i></p>	<p>RED or AMBER medication depending on indication – please check Traffic Light Guidance.</p> <p>Ondansetron orodispersible films sugar-free (Setofilm®) (The film is placed on the tongue and should disintegrate in a few seconds without water.)</p> <p>Please note that use of ondansetron for treating women with hyperemesis gravidarum is outside the product license. A recent drug safety bulletin details the small increased risk of oral clefts associated with its use in the first 12 weeks of pregnancy.^{30, 34}</p>
<p><i>Orphenadrine</i></p>	<p>Licensed liquid formulation is</p> <p>Orphenadrine 50mg/5ml oral solution sugar free</p>
<p><i>Osetamivir</i></p>	<p>Licensed liquid formulation is Tamiflu® 6 mg/ml powder for oral suspension</p> <p>or</p> <p>The capsules can be opened and the contents mixed with a small amount (1 teaspoon) of an appropriate sweetened food, e.g. chocolate syrup, honey, sugar-water, dessert-toppings, sweetened condensed milk, apple sauce, or yogurt. The capsule contents have a bitter taste. The whole dose should be given immediately.^{28,35}</p> <p><u>Administration via enteral tubes:</u> The capsules can be opened and the contents dispersed in water for administration via an enteral feeding tube. ^{1,28} There is no information on administration of the suspension via enteral feeding tubes.</p>
<p><i>Oxcarbazepine</i></p>	<p>Prescribe licensed Oxcarbazepine 60mg/ml oral suspension sugar free (Trileptal®)</p>
<p><i>Oxybutynin</i></p>	<p>Tablets are small – see if child can swallow before prescribing very expensive liquid formulation.</p> <p>If oxybutynin tablets cannot be swallowed then licensed solifenacin liquid is more cost effective than licensed oxybutynin liquid.</p> <p>Vesicare® (solifenacin succinate) 1mg/ml oral suspension is licensed for the indication of neurogenic detrusor overactivity in paediatric patients aged 2-18 yrs.</p> <p>Please note that licensed Oxybutynin oral solution sugar free (5mg in 5ml or 2.5mg in 5ml) costs almost 7 times as much as Vesicare oral suspension so is no longer recommended as an option.</p> <p>Oxybutynin patches (Kentera®) for adults are a similar price to Vesicare® (solifenacin succinate) oral suspension 1mg/ml</p>

Drug	Formulation Alternative / Administration Advice
<p>Oxycodone</p> <p><i>(Controlled Drug)</i></p>	<p>Prescribe licensed Oxycodone 5mg/5ml oral solution sugar free or higher strength OxyNorm® 10mg/ml concentrate oral solution</p> <p><u>Feeding tubes:</u></p> <p>No information on suitability via feeding tube.</p>
<p>Oxytetracycline</p>	<p>Consider alternative licensed once daily tetracycline preparation: see Doxycycline.</p> <p>The tablets <u>should not</u> be crushed for administration to patients with swallowing difficulties due to the risk of oesophageal ulceration and oesophagitis²⁸</p>
P	
<p>Pantoprazole</p>	<p>Not suitable for crushing, see: Lansoprazole, Omeprazole or Esomeprazole.</p>
<p>Paracetamol</p>	<p>Prescribe licensed Paracetamol 120mg/5ml, 250mg/5ml or 500mg/5ml sugar free oral suspensions or sugar free oral solutions (compare prices)</p> <p>or</p> <p>Licensed Paracetamol soluble tablets 500mg (Please note: Soluble tablets have a high sodium content)</p> <p>Paracetamol 500mg suppositories are very high cost.</p>
<p>Paroxetine</p>	<p>No licensed liquid formulation available (Paroxetine 10mg/5ml oral suspension sugar free (Seroxat®) discontinued July 2022).</p> <p>Paroxetine tablets can be crushed and mixed with water for administration. The crushed tablets are bitter and have a slight local anaesthetic effect²⁸</p> <p><u>Enteral feeding tube:</u></p> <p>The tablets can be crushed and mixed with water for administration. They must be crushed well and the tube flushed well as the tablets are film-coated²⁸</p>
<p>Paxlovid®</p>	<p>See Nirmatrelvir/ritonavir</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Perindopril</i></p>	<p>Consider changing to licensed</p> <p>Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Ramipril 2.5mg/5ml oral solution sugar free</p> <p>or</p> <p>Prescribe Perindopril erbumine tablets and label 'crush tablet and disperse contents in water and take immediately...'</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Perindopril erbumine 4mg/5ml oral solution (suspension also available but more expensive)</p> <p><u>Feeding tube:</u></p> <p>If perindopril erbumine is given via enteral tube, stop feed 30 minutes before and after administration.^{28,36}</p>
<p><i>Phenelzine</i></p>	<p>Phenelzine tablets and capsules are both only available as unlicensed specials (Nardil® was discontinued in 2019)</p> <p>Consider changing to another antidepressant (seek specialist advice)</p> <p>or</p> <p>As a last resort - prescribe Phenelzine tablets and label 'crush tablet, disperse in water and take immediately...'¹ (Unstable in water hence immediate administration).</p>

Drug	Formulation Alternative / Administration Advice
<i>Phenobarbital</i>	<p>Prescribe licensed Phenobarbital 15mg/5mL elixir (contains 38% alcohol).</p> <p>Alcohol-free formulations are available from specials manufacturers on request.</p> <p>Note MHRA guidance on changing formulation/manufacturers for epileptic patients.</p> <p>N.B. When managing patients with enteral tubes or swallowing difficulties it may not be possible to maintain the patient on their previous preparation due to the need to change to an appropriate formulation. However all product switches should be carried out with care and close monitoring, and where possible patients should be maintained from then onwards on a single manufacturer's product.²⁸</p> <p>See BNF section 4.8.2 for further information.</p>
<i>Phenytoin</i>	<p>Prescribe licensed Phenytoin 30mg/5ml oral suspension (Epanutin®)</p> <p>N.B. Bioavailability is different between forms: 100mg capsule = 92mg (15mL) syrup.¹⁷</p> <p>Take care when switching from tablet to liquid formulations. See separate document for more details.²⁷</p> <p>Note MHRA guidance on changing formulation/manufacturers for epileptic patients.</p> <p><u>Feeding tubes</u>: it is recommended that phenytoin should NEVER be administered via an enteral feeding tube. ²⁸</p>
<i>Piroxicam</i>	<p>Consider alternative licensed non-steroidal anti-inflammatory drug: see Ibuprofen / Meloxicam</p>
<i>Pilocarpine Eye drops (preservative-free)</i>	<p>Prescribe as licensed Minims Pilocarpine nitrate 2% eye drops 0.5ml unit dose</p> <p>0.1%, 0.25%, 0.5% strengths are unlikely to be of benefit - query strength.¹⁰</p> <p>0.1% w/v normally used for diagnosis only. ¹⁰</p> <p>1 to 4% pilocarpine - Minims® 2% w/v available if appropriate (no potentially sensitising excipients)</p> <p>6% and 8% - very high strengths - check with prescriber.¹⁰</p>
<i>Pizotifen</i>	<p>No licensed liquid formulation available.</p> <p>Unlicensed liquid formulation listed in the Drug Tariff is Pizotifen 250micrograms/5ml oral suspension (oral solution is 8 times more expensive.)</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Potassium</i></p>	<p>Prescribe licensed Kay-Cee-L liquid (highly concentrated 1mmol/ml needs to be diluted before use) or Sando K effervescent tablets.</p> <p>Kay-Cee-L liquid dilute with 50-100ml water before administration. If given via a feeding tube then flush post dose with 15-30ml water. Can cause diarrhoea. ¹</p> <p>Sando-K add to 50 -100ml of water if given via feeding tubes.¹</p> <p>(Please note that licensed generic potassium effervescent 6.5mmol BPC 1968 tablets are also available but this formulation is much more expensive than Sando-K effervescent tablets.) (Slow K tablets and Kloreff effervescent tablets have been discontinued.)</p> <p><u>Feeding tubes</u> – there is a potential for a physical interaction between the feed and potassium if the potassium is not suitably dilute. ¹</p>
<p><i>Pramipexole</i></p>	<p>Prescribe Pramipexole tablets and label 'crush tablet, mix with water or mix with soft food and take ...'²Light sensitive so use immediately.²</p> <p>Modified release tablets should not be chewed, divided or crushed.</p>
<p><i>Pravastatin</i></p>	<p>Low intensity statin – please consider whether still clinically appropriate:</p> <p>Atorvastatin and rosuvastatin are first line statins unless contra-indicated</p> <p>Consider licensed Atorvastatin chewable tablets sugar free (Lipitor®) available as 10mg and 20mg chewable tablets. (Please note high intensity statin reduction action is associated with doses of 20mg daily or more)</p> <p>or</p> <p>Prescribe Rosuvastatin tablets and label 'crush tablet, mix with water and take...'²⁸ (Please note high intensity statin reduction action is associated with doses of 10mg daily or more).</p>
<p><i>Prazosin</i></p>	<p>Prazosin tablets can be dispersed in water for administration. The 500microgram tablet disperses immediately. The 1mg tablet disperses within one minute²⁸.</p> <p><u>Feeding tube:</u> The drug is very insoluble, so flush well after each dose.</p>
<p><i>Prednisolone (Oral)</i></p>	<p>Prescribe licensed Prednisolone 5mg/5ml oral solution unit dose (Prednisolone Dompé®) or Prednisolone 5mg soluble tablets.</p> <p>Please note there is now a licensed higher strength liquid formulation available as Prednisolone 10mg/1ml oral solution sugar-free. Please be aware of the potential for error.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Prednisolone Sodium Phosphate Eye Drops</i></p>	<p>Licensed options:</p> <p>Prednisolone sodium phosphate 0.5% ear/eye drops or Minims® Prednisolone Sodium Phosphate 0.5% eye drops unit dose 0.5ml</p> <p>(Predsol® 0.5% ear/eye drops now discontinued)</p> <p>Prednisolone sodium phosphate 1% is not equivalent in potency to prednisolone acetate 1% (PredForte®), ascertain prescriber is aware.</p> <p>Consider preservative-free dexamethasone eye drops as alternatives for patients who require preservative-free formulations.¹⁰</p> <p>No licensed alternative if strength below 0.5% has been prescribed/dictated by eye specialist.</p> <p>Unlicensed specials listed in Drug Tariff in 10ml bottles in the following strengths: 0.03%, 0.05%, 0.1%, 0.3% and 1% all in standard as well as preservative-free formulations.</p> <p>(Query strengths below 0.1% as 0.1% prednisolone is the preferred strength for patients who require low strength topical corticosteroid).</p>
<p><i>Pregabalin</i></p>	<p>Licensed liquid formulation is Pregabalin 20mg/ml oral solution sugar free</p> <p>Pregabalin capsules can be opened and dispersed in water⁸ although this is not recommended given the availability of the licensed liquid formulation.</p> <p><u>Feeding tube:</u></p> <p>Open the capsules and dissolve the contents in water for administration. No information on administering the oral solution via enteral feeding tube²⁸.</p>
<p><i>Primidone</i></p>	<p>No licensed liquid formulation available.</p> <p>Primidone tablets can be crushed and dispersed in water for administration. Without crushing they will disperse in two to five minutes. The drug is poorly soluble²⁸.</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Primidone 50mg/5ml oral suspension. (The 62.5mg/5ml and 250mg/5ml formulations are more expensive.)</p> <p>Note MHRA guidance on changing formulation/manufacturers for epileptic patients.</p>

Drug	Formulation Alternative / Administration Advice
<i>Prochlorperazine</i>	<p>Prescribe licensed Prochlorperazine 5mg/5ml oral solution</p> <p>(Dilute with the same volume of water before administration via feeding tube.¹)</p> <p>Licensed Prochlorperazine 3mg buccal tablets are available but are more expensive than the liquid.</p>
<i>Procyclidine</i>	Prescribe licensed Procyclidine oral solution sugar-free 2.5mg/5ml or 5mg/5ml
<i>Promazine</i>	Prescribe licensed Promazine oral solution 25mg/5ml or 50mg/5ml
<i>Promethazine hydrochloride</i>	Prescribe licensed Promethazine 5mg/5ml oral solution sugar free (Phenergan®)
<i>Propranolol</i>	<p>Consider changing to once daily Atenolol if clinically appropriate</p> <p>or</p> <p>Prescribe as licensed Propranolol oral solution sugar free 5mg/5ml, 10mg/5ml 40mg/5ml or 50mg/5ml</p>
<i>Pyridostigmine</i>	<p>Crush or disperse tablet in water (Mestinon®)</p> <p>Dispersion occurs slowly (at least 5 minutes) with fine powder sediment.¹</p> <p>or</p> <p>Licensed Pyridostigmine bromide 12mg/1ml oral solution sugar free (Viatrix UK Healthcare Ltd). Licensed for administration via NG and PEG tube – see SPC for further information ⁴⁴.</p>
<i>Pyridoxine</i>	<p>No licensed liquid available.</p> <p>Tablets can be crushed and mixed with water to make a dispersion but slow to disperse and forms a coarse suspension.¹</p> <p>Unlicensed liquid formulation listed in the Drug Tariff Pyridoxine 100mg/5ml oral solution (the oral suspension is more expensive).</p>
Q	

Drug	Formulation Alternative / Administration Advice
<p>Quetiapine</p>	<p>Prescribe licensed Quetiapine 20mg/ml oral suspension sugar-free</p> <p>or</p> <p>Prescribe Quetiapine tablets (non-MR) and label 'mix crushed tablet with yoghurt and take...' (not soluble).²</p> <p>or</p> <p>Last resort - use an unlicensed special listed in the Drug Tariff. Prescribe Quetiapine 12.5mg/5ml, 25mg/5ml or 50mg/5ml oral suspension</p>
R	
<p>Ramipril</p>	<p>Prescribe licensed Ramipril 2.5mg/5ml oral solution sugar free</p> <p>or</p> <p>Ramipril tablets can be crushed and dispersed in water.¹</p>
<p>Ranitidine</p>	<p><i>Following advice from the EMA, the MHRA have suspended all licenses for ranitidine products.</i></p> <p><i>All formulations of ranitidine are affected due to the presence of low levels of an impurity called N-nitrosodimethylamine (NDMA).</i></p> <p><i>Until regulatory investigations are complete, and an uncontaminated supplier of ranitidine active ingredient has been found, no further supplies of ranitidine will be manufactured.</i></p> <p>Use an alternative product e.g. omeprazole, lansoprazole</p>
<p>Rifampicin</p>	<p>Prescribe licensed Rifampicin 100mg/5ml oral suspension (Rifadin® Syrup)</p> <p><u>Feeding tubes</u>: dilute with an equal volume of water before administration.</p>
<p>Riluzole</p>	<p>Licensed liquid formulation is Riluzole 5mg/ml oral suspension (Teglutik®)</p> <p>or</p> <p>Riluzole tablets can be crushed and mixed with soft food e.g. yogurt or puree, to aid swallowing. Tablets crushed onto food should be eaten within fifteen minutes as there is no stability data available for this method of administration. Use crushed tablets with care as they may have a local anaesthetic effect in the mouth.²⁸</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Risedronate</i></p>	<p>If liquid preparation required, consider switching to:</p> <p>Licensed Alendronic acid oral solution sugar-free 70mg/100ml</p> <p>or</p> <p>Alendronic acid 70mg effervescent tablet (Binosto®) dissolved in at least 120ml water</p> <p>or</p> <p>Denosumab (Prolia®) 60mg/1ml solution for injection pre-filled syringe</p>
<p><i>Risperidone</i></p>	<p>Prescribe licensed Risperidone 1mg/ml oral solution sugar-free</p> <p>or</p> <p>Prescribe licensed Risperidone orodispersible tablets (more expensive than the liquid).</p>
<p><i>Rivaroxaban</i></p>	<p>Xarelto® (Rivaroxaban) tablets may be crushed and mixed with water or apple puree immediately prior to use and administered orally.⁷ Xarelto® tablets are licensed to be administered in this way.</p> <p>Xarelto® tablets may be crushed and suspended in 50 mL of water and administered via a nasogastric tube or gastric feeding tube after confirming gastric placement of the tube. Afterwards, the tube should be flushed with water.⁷ Xarelto® tablets are licensed to be administered in this way.</p> <p>After the administration of crushed Xarelto® 15 mg or 20 mg film-coated tablets, the dose should then be immediately followed by food / enteral feeding as appropriate.⁷</p> <p>or</p> <p>Licensed liquid formulation is Xarelto® 1mg/ml granules for oral suspension. Licensed for the treatment of venous thromboembolism (VTE) and prevention of VTE recurrence in term neonates, infants and toddlers, children, and adolescents aged less than 18 years after at least 5 days of initial parenteral anticoagulation treatment.</p> <p>The suspension may be given through a nasogastric or gastric feeding tube (licensed to be administered in this way)³⁸. See SPC for further information</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Rosuvastatin</i></p>	<p>No licensed liquid formulation available.</p> <p>Consider age of patient and if still clinically appropriate.</p> <p>Rosuvastatin hard capsules (Sun Pharmaceutical) can be opened and the granules sprinkled on 1 teaspoonful of soft food e.g. apple sauce or chocolate/vanilla flavoured pudding. The mixture should be swallowed within 60 minutes followed by drinking at least 240ml water. The granules should not be chewed³⁹.</p> <p>The granules are also licensed to be administered via nasogastric tubing (see SPC for instructions)³⁹.</p> <p>or</p> <p>Consider licensed Atorvastatin chewable tablets sugar free (Lipitor®) available as 10mg and 20mg chewable tablets. (Please note high intensity statin reduction action is associated with doses of 20mg daily or more)</p> <p>or</p> <p>Prescribe Rosuvastatin tablets and label 'crush tablet, mix with water and take...'²⁸</p>
<p>S</p>	
<p><i>Selegiline</i></p>	<p>Selegiline tablets can be dispersed in water for administration. They disperse within one minute. ²⁸</p> <p>(Selegiline (Zelapar®) 1.25mg oral lyophilisates are discontinued)</p>
<p><i>Sertraline</i></p>	<p>No licensed liquid formulation available,</p> <p>Consider alternative licensed selective serotonin re-uptake inhibitors: see Citalopram / Fluoxetine / Paroxetine</p> <p>or</p> <p>Prescribe Sertraline tablets and label 'disperse tablet in water and take immediately...' or label 'crush tablet, mix with food and take immediately...'¹</p> <p>Unlicensed specials listed in the Drug Tariff are Sertraline oral suspension 50mg/5ml and 100mg/5ml (avoid the 25mg/5ml strength as very high cost).</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Simvastatin</i></p>	<p>Simvastatin is only a high intensity statin at doses of 80mg or above and as MHRA report an increased risk of myopathy associated with high dose (80 mg) simvastatin this no longer a preferred option</p> <p>Atorvastatin and rosuvastatin are first line statins for all new patients unless contra-indicated</p> <p>Consider age of patient and if still clinically appropriate</p> <p>Consider licensed Atorvastatin chewable tablets sugar free (Lipitor®) available as 10mg and 20mg chewable tablets. (Please note high intensity statin reduction action is associated with doses of 20mg daily or more)</p> <p>or</p> <p>Prescribe Rosuvastatin tablets and label ‘crush tablet, mix with water and take...’²⁸ (Please note high intensity statin reduction action is associated with doses of 10mg daily or more).</p> <p>or</p> <p>Licensed liquid formulation is Simvastatin oral suspension sugar free 20mg/5ml and 40mg/5ml.</p>
<p><i>Sodium Bicarbonate Oral Solution</i></p>	<p>Licensed Sodium bicarbonate 500mg capsules can be opened and the contents mixed in a glass of water as per instructions in the PIL.²⁵ This is the most cost-effective option for patients who are unable to swallow tablets or capsules.</p> <p>Licensed liquid formulations are:</p> <p>Bidex® 84mg/ml oral solution 100ml bottle: Discard 7 days after first opening⁴²</p> <p>Thamicarb® 84mg/ml oral solution 100ml bottle: Discard 3 days after first opening. 500ml bottle: Discard 7 days after first opening²⁰.</p> <p>Sodium Bicarbonate 1mmol/ml = Sodium Bicarbonate 8.4% = Sodium Bicarbonate 420mg/5ml = Sodium Bicarbonate 84mg/ml</p>
<p><i>Sodium Chloride 0.9% Eye Drops Preservative-free</i></p>	<p>Prescribe Minims® Saline 0.9% eye drops 0.5ml unit dose</p> <p>Other lubricants may be more suitable¹⁰ see formulary options.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Sodium Chloride 5% Eye Ointment and Eye drops</i></p>	<p>For corneal oedema, recurrent corneal erosion syndrome.</p> <p><u>Sodium Chloride 5% eye ointment</u></p> <p>Licensed product is</p> <p>Sodium Chloride 5% eye ointment preservative free (Alissa Healthcare) £22.50</p> <p>Unlicensed special listed in the Drug Tariff:</p> <p>Sodium Chloride 5% eye ointment - preserved with methyl parahydroxybenzoate and propyl parahydroxybenzoate, also contains lanolin.¹⁰ Avoid as unlicensed and very expensive £113.92</p> <p><u>Sodium Chloride 5% eye drops are available with and without preservative</u></p> <p>Licensed products (Appliances not medicines) – with preservatives:</p> <p>Hypersal® 5% 10ml bottle (contains preservatives) £25.25</p> <p>Licensed products (Appliances not medicines) – preservative free 10ml bottle:</p> <p>ODM5® 10ml bottle preservative free (28 day product expiry once opened) £24.00</p> <p>PF Drops® Sodium Chloride 5% 10ml bottle preservative free (56 day product expiry once opened) £25.20</p> <p>SodiEye® 5% 10ml bottle preservative free (12 months of shelf life from the time of opening) £15.98</p>
<p><i>Sodium Chloride Oral Solution</i></p>	<p>Licensed formulations:</p> <p>SodiClor® 1mmol/ml (5.85%) contains 292.5mg in 5ml</p> <p>and</p> <p>SodiClor® 5mmol/ml (29.25%) contains 1.46g in 5ml</p> <p>(Licensed with the MHRA as a food supplement) 100ml bottles. Expiry date of 7 days after opening.</p>
<p><i>Sodium Cromoglycate Eye Drops Preservative-free</i></p>	<p>Hayfever remedies are considered to be selfcare treatments and are not for FP10 prescribing</p> <p>If preservative-free Sodium cromoglycate eye drops are required on FP10 please prescribe as licensed <u>Catacrom® 2% eye drops 0.3ml unit dose</u></p>

Drug	Formulation Alternative / Administration Advice
<i>Sodium Valproate</i>	<p>Licensed liquid formulation is Sodium Valproate 200mg/5ml oral solution sugar free (generic)</p> <p>(Epilim® available as crushable tablets, Chronosphere MR granule sachets, liquid (sugar-free) or syrup.</p> <p>Take care when switching. See separate document for more details.²⁷</p>
<i>Solifenacin</i>	<p>Licensed liquid formulation is Vesicare® (Solifenacin) 1mg/1ml oral suspension or Solifenacin 5mg/5ml oral solution sugar free</p> <p>Crushing the tablets is not recommended as the powder released is irritant to the eyes²⁸.</p>
<i>Sotalol</i>	<p>No licensed liquid formulation available.</p> <p>Consider alternative licensed beta-blocker preparation: see Atenolol / Propranolol</p> <p>or</p> <p>Prescribe Sotalol tablets and label 'crush tablet, mix with water and take...'¹</p> <p>or</p> <p>Prescribe unlicensed special listed in the Drug Tariff - Sotalol 25mg/5ml oral suspension (unlicensed but price controlled)</p>
<i>Spirolactone</i>	<p>No licensed liquid formulation available</p> <p>Prescribe licensed Spirolactone tablets and label 'crush tablet, disperse in water and take...'¹</p> <p>N.B. Can take five minutes for tablet to completely disperse.</p> <p>or</p> <p>Prescribe unlicensed special listed in the Drug Tariff - Spirolactone oral suspension 5mg/5ml, 10mg/5ml, 50mg/5ml or 100mg/5ml (avoid oral solution as much more expensive).</p>
<i>Sucralfate</i>	<p>Licensed liquid formulation is Sucralfate 1g/5ml oral suspension sugar free</p>
<i>Sulfasalazine</i>	<p>Licensed liquid formulation is Sulfasalazine 250mg/5ml oral suspension sugar free.</p>
<i>Sulpiride</i>	<p>Licensed liquid formulation is Sulpiride 200mg/5ml oral solution sugar free</p>

Drug	Formulation Alternative / Administration Advice
T	
<i>Tacrolimus</i>	Secondary care to prescribe as it is a RED drug
<i>Tamoxifen</i>	Licensed liquid formulation is Tamoxifen 10mg/5ml oral solution sugar free
<i>Tamsulosin</i>	<p>No licensed liquid formulation.</p> <p>Consider prescribing alternative – see Doxazosin or Indoramin</p> <p>or</p> <p>If no suitable alternative, Tamsulosin MR Capsules contain granules which should not be crushed. There is anecdotal evidence that they can be given to patients by opening the capsule and the medication administered with water without crushing.³¹ Do not crush modified release formulations. ¹ Not suitable for opening for tube administration. There are reports of tamsulosin blocking enteral feeding tubes²⁸.</p> <p>or</p> <p>Last resort – unlicensed special listed in the Drug Tariff - Tamsulosin 400micrograms/5ml oral solution (approx. £127 per 100ml. Oral suspension also available but more expensive – avoid.)</p>
<i>Temazepam</i>	<p>Licensed liquid formulation is Temazepam 10mg/5ml oral solution sugar free</p> <p>Please note that this is very high cost. Please consider licensed Zolpidem tablets which can be crushed and dispersed in water (unlicensed administration). ¹</p>
<i>Terbinafine</i>	<p>No licensed liquid available.</p> <p>Prescribe Terbinafine tablets and label 'crush tablet, mix with water and take...²⁸</p> <p>Last resort – Unlicensed special listed in the Drug Tariff is Terbinafine 250mg/5ml oral suspension</p>
<i>Tetracycline</i>	<p>No licensed liquid formulation available.</p> <p>Consider alternative licensed tetracycline preparation: see Doxycycline - which is available as a dispersible tablet.</p>

Drug	Formulation Alternative / Administration Advice
<i>Thiamine</i>	<p>Please review clinical indication – see guidance about use in the prevention of Wernicke’s Encephalopathy.³²</p> <p>If still required, prescribe Thiamine tablets and label ‘crush tablet, mix with water and take...^{1,2}</p> <p>Tablets disperse quickly and easily.</p>
<i>Ticagrelor</i>	<p>Prescribe licensed Ticagrelor 90mg orodispersible tablets sugar free.</p> <p>The tablet should be placed on the tongue, where it will rapidly disperse in saliva. It can also be dispersed in water and administered via a nasogastric tube (CH8 or greater). It is important to flush the nasogastric tube through with water after administration of the mixture²⁶.</p>
<i>Tocopherol</i>	See Vitamin E
<i>Tolbutamide</i>	Consider changing to an alternative sulphonylurea - see formulary.
<i>Tolterodine</i>	<p>Consider changing to licensed Vesicare® 1mg/1ml oral suspension or Solifenacin 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Prescribe Tolterodine tablets which can be dispersed in water for administration. They disperse within one minute. Use immediately²⁸.</p>
<i>Topiramate</i>	<p>Prescribe licensed Topamax® Sprinkle Capsules that can be sprinkled onto soft food.</p> <p>(Please note that Sprinkle Capsules may block an enteral tube. Topiramate tablets can be crushed and dispersed in water for administration via an enteral feeding tube²⁸)</p> <p>or</p> <p>Licensed Topiramate 50mg/5ml oral suspension sugar free (higher cost per dose compared with Topamax® Sprinkle Capsules)</p>
<i>Tramadol</i>	<p>Prescribe licensed Tramadol 50mg soluble tablets sugar free</p> <p>Or</p> <p>Tramadol 50mg/5ml oral solution sugar free (Morningside Healthcare Ltd)</p>

Drug	Formulation Alternative / Administration Advice
<i>Trandolapril</i>	<p>Trandolapril capsules can be opened and the contents dispersed in water before administration. The capsule contents have a bitter taste which can be masked by fruit squash²⁸</p> <p>or</p> <p>Consider changing to</p> <p>Licensed Lisinopril 5mg/5ml oral solution sugar free</p> <p>or</p> <p>Licensed Ramipril 2.5mg/5ml oral solution sugar free</p>
<i>Tranexamic acid</i>	<p>Tranexamic acid tablets can be crushed and mixed with water for administration. Without crushing they disperse in two to five minutes²⁸.</p> <p>or</p> <p>Unlicensed specials listed in the Drug Tariff are Tranexamic acid 500mg/5ml oral suspension and Tranexamic acid 500mg/5ml oral solution (250mg/5ml oral suspension also available but more expensive).</p>
<i>Tranexamic acid mouthwash</i>	<p>Tranexamic acid 5% mouthwash is listed as an unlicensed special in the Drug Tariff.</p>
<i>Trazodone</i>	<p>Licensed liquid formulation is Trazodone 50mg/5ml oral solution sugar free (licensed 100mg/5ml oral solution also available but much more expensive – avoid).</p>
<i>Trihexyphenidyl (Benzhexol)</i>	<p>Licensed liquid formulation is Trihexyphenidyl 5mg/5ml oral solution</p>
<i>Trifluoperazine</i>	<p>Licensed liquid formulation is Trifluoperazine 5mg/5ml oral solution sugar free (licensed 1mg/5ml oral solution also available but much more expensive - avoid).</p>
<i>Trimipramine</i>	<p>No licensed liquid formulation available.</p> <p>The cost of oral trimipramine has increased massively – please consider alternative licensed tricyclic antidepressant: see Amitriptyline / Lofepamine</p>
U	
<i>Ursodeoxycholic acid</i>	<p>Licensed liquid formulation is Ursodeoxycholic Acid 250mg/5ml oral suspension sugar free (Ursofalk®)</p>

Drug	Formulation Alternative / Administration Advice
V	
<i>Valaciclovir</i>	No licensed liquid formulation available. Tablets are not dispersible. Consider using Aciclovir dispersible tablets
<i>Valproic acid</i>	No licensed liquid available. See Sodium Valproate – take care when switching from Valproic acid to Sodium Valproate formulations. See separate guidance.²⁷
<i>Valsartan</i>	Licensed liquid formulation is Valsartan 3mg/ml oral solution (Diovan®) . Not dose equivalent to tablets . When converting from tablets to oral solution halve the tablet dose (see dose conversion table in the SPC). ¹
<i>Vancomycin</i>	Please refer to Specialist Pharmacy Service guidance: Choosing between oral vancomycin options – SPS - Specialist Pharmacy Service – The first stop for professional medicines advice
<i>Venlafaxine</i>	Licensed liquid formulation is Venlafaxine oral solution sugar free 37.5mg/5ml or 75mg/5ml – licensed for administration via nasogastric (NG) or percutaneous endoscopic gastrostomy (PEG) tubes (Note: very expensive) For major depression consider alternative licensed Mirtazepine orodispersible tablets or Mirtazepine oral solution 15mg/1ml . or Prescribe Venlafaxine tablets (non-MR) and label 'crush tablet, mix with water and take...' ¹
<i>Verapamil</i>	Licensed liquid formulation is Verapamil 40mg/5ml oral solution sugar free
<i>Vitamin D</i>	See Colecalciferol

Drug	Formulation Alternative / Administration Advice
<p><i>Vitamin E</i> (<i>tocopherol, alpha tocopherol</i>)</p>	<p>Valupak Vitamin E 100unit capsules are a cost-effective formulation with fixed NHS prices - use these where possible.</p> <p>Licensed liquid formulation: Alpha tocopheryl acetate 500mg/5ml oral suspension (Approx £73 per 100ml - please avoid if possible).</p> <p>Chewable tablets 100mg are high cost compared to Valupak capsules.</p> <p>Ephynal chewable tablets are unlicensed and imported so are therefore expensive.</p> <p>Take care when switching. See separate document for more details.²⁷</p>
W	
<p><i>Warfarin</i></p>	<p>Licensed liquid formulation is Warfarin 1mg/ml oral suspension sugar free</p> <p>or</p> <p>Warfarin tablets can be crushed and mixed with water for administration. Without crushing they disperse in two to five minutes²⁸.</p>
Z	
<p><i>Zolmitriptan</i></p>	<p>Licensed Zolmitriptan orodispersible tablets 2.5mg and 5mg available</p> <p>A nasal spray is available but is a much more expensive option.</p>
<p><i>Zolpidem</i></p>	<p>For short term use only / if still appropriate:</p> <p>Zolpidem tablets can be crushed and dispersed in water.¹</p> <p>or</p> <p>Consider licensed Temazepam 10mg/5ml oral solution sugar free - please note that this is very expensive.</p>
<p><i>Zonisamide</i></p>	<p>Licensed liquid formulation is Zonisamide 20mg/ml oral suspension (Desizon®)</p> <p>If desired the suspension can be diluted in water, orange juice or yogurt for administration. Carbonated beverages should not be used³⁷.</p> <p>Feeding tube:</p> <p>Desizon® oral suspension is licensed for administration via enteral feeding tubes. The enteral feeding tube should be flushed three times with 5mL of water each time after each dosage³⁷. See SPC for further details.</p>

Drug	Formulation Alternative / Administration Advice
<p><i>Zopiclone</i></p>	<p>No licensed liquid formulation available. Manufacturers recommend that zopiclone tablets should not be crushed. (Tablets are hard and difficult to crush and have a bitter taste.)¹</p> <p>For short term use only / if still appropriate</p> <p>Consider alternative licensed hypnotic see: Temazepam</p> <p>or</p> <p>Consider licensed zolpidem tablets which can be crushed and dispersed in water (unlicensed administration).¹</p> <p>or</p> <p>Unlicensed zopiclone specials listed in the Drug Tariff are:</p> <p>Zopiclone oral solution 3.75mg/5ml or 7.5mg/5ml</p> <p>Zopiclone oral suspension 3.75mg/5ml or 7.5mg/5ml</p>

Appendix i

How to use an Oral Syringe

Use of an oral syringe is considered to be more accurate than a medicine spoon or cup.

For a Great Ormand Street Hospital video showing how to give liquid medicines via an oral syringe please see the following link:

<http://www.youtube.com/watch?v=S67bNkcSVfs&feature=youtu.be>

Position Statement by the Neonatal & Paediatric Pharmacist Group (NPPG) regarding the Administration of Medicines Using ENFit Syringes: [NPPG-Position-Statement-ENFit-V1.pdf](#)

Appendix ii

Administration of Drugs via Feeding Tubes - General Guidelines:

Position Statement by the Neonatal & Paediatric Pharmacist Group (NPPG) regarding the Administration of Medicines Using ENFit Syringes: [NPPG-Position-Statement-ENFit-V1.pdf](#)

Administering drugs via feeding tubes is an unlicensed activity. There is little published data and most recommendations are theoretical and/or based on local policy. An alternative licensed option is therefore always preferable e.g. rectal or parenteral formulations.

Types of Feeding Tubes

There are several types of feeding tubes. (*N.B.* These can be further classified according to lumen size, number of lumen and length of use).

Nasogastric (<i>NG</i>)	Inserted into the stomach via the nose
Nasojejunal (<i>NJ</i>)	Inserted into the jejunum via the nose
Percutaneous endoscopic gastrostomy (<i>PEG</i>)	Inserted into the stomach via the abdominal wall
Percutaneous endoscopic jejunostomy (<i>PEJ</i>)	Inserted into the jejunum via the abdominal wall
Percutaneous endoscopic gastro-jejunostomy (<i>PEGJ</i>)	Inserted into the jejunum via the abdominal wall and through the stomach

General Guidelines for Administration

The following should be considered when giving drugs via feeding tubes:

1.	Ensure route of administration has been specified
2.	Ensure the siting of the tube has been medically confirmed
3.	Oral syringes (i.e. a syringe to which a needle cannot be attached) should be used to prevent accidental parenteral administration.
4.	Stop the infusion of a feed when administering drugs. Refer to ' <i>Drug Interactions</i> ' for further guidance.
5.	Flush the tube slowly with at least 15mL of water (sterile water if jejunal tube) using either a 30mL or 50mL oral syringe.
6.	Administer each drug separately (by gravity flow) as a sediment free liquid. Flush in between and afterwards with at least 15mL of water (sterile water if jejunal tube) using either a 30mL or 50mL oral syringe.
7.	Monitor clinical response if <ul style="list-style-type: none"> Changing from modified release to normal release preparations A drug has a narrow therapeutic index The bio-availability of the drug differs between tablet and liquid.
8.	Do not administer bulk-forming laxatives because they block the tubes; use an enteral feed with a high-fibre content instead
9.	Do not add drugs to feeds; this increases the risk of incompatibility, microbial contamination, tube blockage and underdosing or overdosing if the feed rate is altered.
Also consider:	
<i>Size of lumen</i>	Narrow lumen tubes are more likely to block, particularly with thick oral syrups; dilute with 30-60mL of water before administration.
<i>Number of lumens</i>	Ensure correct lumen is used with multilumen tubes; do not use an aspiration gastric decompression port for drug administration.
<i>Function of tube</i>	Drugs should not be administered by tube if it is on free-drainage or suction

Choosing a Suitable Formulation

Commercially available oral solutions/ suspensions/ syrups are not always suitable for administration into feeding tubes because:

Problem	Reason	Preventive measures that can be taken
Osmotic diarrhoea	Due to high osmolarity and sorbitol content	Osmolarity can be reduced in some preparations by diluting with as much as much water as practical.
Altered bio-availability and/or pharmacokinetics	When converting from tablets to oral solution, e.g. digoxin and Phenytoin or from modified release preparations to oral solution.	The dose and/or frequency may need to be changed according to clinical response
Tube blockage/ caking	Caused by high viscosity preparations e.g. co-amoxiclav	Minimise by diluting with 30-60mL water or use suspensions rather than syrups.
Clumping of the feed	Particularly if the formulation is acidic, i.e. pH<4	Find alternative route/ preparation if possible Dilute the drug as much as possible to minimise drug-feed contact and flush with 30-60mL of water
Binding to the Plastic Tubing	e.g. Carbamazepine, clonazepam, diazepam, Phenytoin	Dilute the drug with at least 30-60mL water and flush well.

Tablets/capsules

Many tablets and capsule contents will disperse completely when crushed and mixed with water, even though they are not marketed as dispersible.

- Do not administer crushed tablets or capsule contents which have not completely dispersed in water; sediment increases the risk of blocking the tube.
- The liquid contents of some capsules can be drawn out with a syringe, but should be administered immediately in case of light sensitivity.

Injections

This is generally an expensive option and should therefore be considered only for the short term.

- Before administering an injectable formulation via a feeding tube, check osmolarity. Many injections are hypertonic and therefore unsuitable.
- Some injections may also contain additives unsuitable for oral administration. e.g. polyethylene glycol in amiodarone.
- All injections should be further diluted with 30-60mL of water before administration.

References

1. Handbook of Drug Administration via Enteral Feeding Tubes, Pharmaceutical Press 2015
2. Administration methods of medications via Enteral Feeding Tubes Produced by: Pharmacy Medicines Information, Royal Cornwall Hospitals, Truro February 2009
3. BNF online <https://bnf.nice.org.uk/> Last accessed 23/03/22
4. <http://ods.od.nih.gov/factsheets/vitamine/> accessed 28/11/16
5. Personal communication Flynn Pharma Ltd 28/11/16
6. Elvanse® SPC <https://www.medicines.org.uk/emc/product/2979/smpc> Accessed 23/03/22
7. Xarelto® SPC <https://www.medicines.org.uk/emc/product/6402> accessed 11/03/22
8. Personal Communication Pfizer Medical Information 9/12/13
9. Personal communication , Pharmacy Team, Bristol Children's Hospital 29/11/13
10. Ophthalmic Special Order Products. 2014 Royal College of ophthalmologists and UK Ophthalmic Pharmacy Group
11. US Dept of Veterans Affairs Pharmacy Management Service
<http://www.pbm.va.gov/clinicalguidance/drugclassreviews.asp> accessed 15/10/14
12. <http://www.medicinesforchildren.org.uk/methylphenidate-attention-deficit-hyperactivity-disorder-adhd>
accessed 28/11/16
13. Eliquis® SPC <https://www.medicines.org.uk/emc/product/4756/smpc> Accessed 23/03/22
14. Communication from the manufacturers Astellas 15/2/2016
15. Ventra® capsules SPC <https://www.medicines.org.uk/emc/product/4447/smpc> Accessed 24/03/22
16. Emozul® capsules SPC
<https://mhraproducts4853.blob.core.windows.net/docs/9438d6a8a7db01e739abe8b934516ac8f794ea99>
Accessed 24/03/22
17. BNF App accessed 12/12/17
18. Zantac liquid spc <https://www.medicines.org.uk/emc/product/218/smpc> accessed 12/12/17
19. Ranitidine liquid spc (Rosemont) <https://www.medicines.org.uk/emc/product/1736/smpc> accessed 12/12/17
20. Thambicarb® SPC 84mg/ml oral solution <https://www.medicines.org.uk/emc/product/2458> Accessed 24/03/22
21. Mezzopram® SPC <https://www.medicines.org.uk/emc/medicine/24521/SPC> Accessed 24/03/22
22. Hiprex® SPC <https://www.medicines.org.uk/emc/product/1530> Accessed 02/03/22
23. Medicines for Children <https://www.medicinesforchildren.org.uk/> Accessed 24/03/22
24. <https://www.medicines.org.uk/emc/product/9518> accessed 10/1/19
25. Sodium bicarbonate 500mg capsule PIL
<https://mhraproducts4853.blob.core.windows.net/docs/ec8d2493ebd7e8bd7eee75132ca7ec17d348ec35>
Accessed 24/03/22
26. Brilique® SPC <https://www.medicines.org.uk/emc/product/2692> Accessed 22/03/22
27. Switching between liquid and tablet/capsule formulations – Which medicines require extra care?
<https://www.sps.nhs.uk/articles/switching-between-liquid-and-tablet-capsule-formulations-which-medicines-require-extra-care/> UKMI Update July 2021
- 28 The NEWT Guidelines <https://www.newtguidelines.com/> Last accessed 24/03/22

- 29 Equasym® XL SPC <https://www.medicines.org.uk/emc/product/3887/smpc> Accessed 24/03/22
30. Drug Safety Update January 2020 <https://www.gov.uk/drug-safety-update/ondansetron-small-increased-risk-of-oral-clefts-following-use-in-the-first-12-weeks-of-pregnancy> - accessed 11/2/2020
31. Communication form Sanofi Medical Information 22/1/2020
32. Regional Medicines Optimisation Committee (RMOC) Position Statement-Oral vitamin B supplementation in alcoholism. November 2019 <https://www.sps.nhs.uk/articles/rmoc-position-statement-oral-vitamin-b-supplementation/>
33. Vancomycin 1g Powder for solution for infusion spc – <https://www.medicines.org.uk/emc/product/6255/smpc> - accessed 13/2/2020
34. UK Teratology Information Service, Official Response Statement: Ondansetron. <http://www.uktis.org/docs/Ondansetron%20UKTIS%20Response%20Statement.pdf> accessed 14/2/2020
35. Tamiflu® capsules SPC <https://www.medicines.org.uk/emc/product/1194/smpc> Accessed 16/12/2021
36. Medication management of patients with nasogastric (NG), percutaneous endoscopic gastrostomy (PEG), or other enteral feeding tubes. Guidelines 2nd April 2019 <https://www.guidelines.co.uk/dysphagia/medication-management-of-patients-with-enteral-feeding-tubes/454634.article>
37. Desizon® SPC <https://www.medicines.org.uk/emc/product/11954/smpc> Accessed 10/03/22
38. Xarelto® 1mg/ml granules for oral suspension SPC <https://www.medicines.org.uk/emc/product/12108/smpc> Accessed 11/03/22
39. Rosuvastatin hard capsules SPC (Sun Pharmaceuticals) <https://www.medicines.org.uk/emc/product/13272> Accessed 23/03/22
40. Ritalin® XL SPC <https://www.medicines.org.uk/emc/product/11094/smpc> Accessed 24/03/22
41. Zomorph® capsules SPC <https://www.medicines.org.uk/emc/product/1420> Accessed 24/03/22
42. Bidex® oral solution PIL <https://www.medicines.org.uk/emc/product/10532/pil> Accessed 24/03/22
43. Lixiana® SPC <https://www.medicines.org.uk/emc/product/6907/smpc> Accessed 24/03/22
44. Pyridostigmine bromide 12mg/ml oral solution SPC <https://mhraproducts4853.blob.core.windows.net/docs/361c4358377140c6c2af54e36630fdddbf35a15d> Accessed 29/03/22
45. Parkinson's disease medicines formulations for adults with swallowing difficulties – Specialist Pharmacy Service (SPS) Accessed 11/08/22 <https://www.sps.nhs.uk/articles/parkinsons-disease-medicines-formulations-for-adults-with-swallowing-difficulties/>
46. Communication from Roche Medical Information 08/04/22
47. Xaqua® SPC <https://www.medicines.org.uk/emc/product/13419> Accessed 11/08/22
48. Administering Paxlovid as crushed tablets – University of Liverpool COVID-19 Drug Interactions Prescribing Resources www.covid19-druginteractions.org/prescribing_resources/paxlovid-crushing-tablets