

Alternatives to using an Unlicensed "Special" Version 7 (October 2022)

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Before considering other formulations/preparations, first ensure that the drug is still needed and the patient is compliant.

[For general advice on selecting the best option see SPS: Choosing formulations of medicines for adults with swallowing difficulties.](#)

[For advice on preparing medicines e.g. how to disperse tablets, see SPS: Preparing medicines for administration to adults with swallowing difficulties](#)

[For information about enteral feeding tubes, see SPS: How enteral feeding tubes affect medicines](#)

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Acetazolamide	No licensed oral liquid available.	The standard tablets disperse with a fine sediment. They disperse in one to five minutes. Rinse equipment well to ensure the whole dose is given. ² The MR capsules are generally not considered suitable for use for swallowing difficulties or enteral tubes. Although some centres have opened them and flushed the contents down enteral feeding tubes ² - this should only be done on specialist advice.	250mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Acetylcysteine	GREY if being used as mucolytic (use carbocisteine) RED for renal protection - refer back to specialist LICENSED 600mg effervescent tablets available (prescribe as NACSYS brand) LICENSED Mucolight 600mg tablets and 200mg oral powder sachets available, but <u>very</u> expensive.	Effervescent tablets are preferred choice for enteral tube or oral use. Stop enteral feed prior to administration and restart afterwards. ²	Unlikely to need: licensed alternative available
Alendronic acid	Consider if still appropriate. Irritant to oesophagus. Contra-indicated/cautioned in some indications linked to swallowing difficulty. Zolendronic acid licensed for once yearly intravenous administration is probably the most appropriate form of biphosphonate ² . LICENSED effervescent tablets and liquid available.	Do not crush tablets - risk of oesophageal damage. No info on using effervescent tablets or liquid for enteral feeding tubes. ²	Unlikely to need: licensed alternative available
Alfuzosin	No licensed oral liquid available.	Standard (film-coated) tablets can be crushed and dispersed in water for oral or enteral tube use. ² Do not crush modified release tablets, convert to standard release - risk of hypotension so advisable to start at 2.5mg TDS (BD for elderly) and increase as tolerated. ²	No liquid in Drug Tariff
Allopurinol	No licensed oral liquid available.	The tablets can be crushed and mixed with water for enteral tube or oral use. The 100mg tablets will disperse within one minute without crushing. The 300mg tablets take longer to disperse and should be crushed well as the drug is not very soluble. Give immediately. ² For enteral feeding tubes, administer after feed. ²	100mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ OR 300mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Amiloride HCl	LICENSED 5mg/5ml oral solution sugar free available (<u>Very</u> expensive - £160 for 150ml)	The tablets can be crushed and dispersed in water for enteral tube or oral use. Different brands may disperse in water at notably different rates. ²	Unlikely to need: licensed alternative available
Amiodarone	No licensed oral liquid available.	Tablets can be crushed and mixed with water for oral or enteral tube use. Without crushing they disperse in around 5 minutes. Bitter taste; if taking orally mix with fruit juice. Give immediately. ²	50mg/5ml and 100mg/5ml oral suspension included in Part VIII B of Drug Tariff. Minimum quantity 100ml ³
Amisulpride	LICENSED oral solution available (100mg/ml - 2 months expiry once opened) £105 for 60ml		Unlikely to need: licensed alternative available
Amitriptyline	LICENSED oral solution SF available (25mg/5ml and 50mg/5ml - some manufacturers only give 1 month expiry once opened) 10mg/5ml also available, but <u>very</u> expensive	Use the oral solution. Absorption may be decreased by high-fibre feeds. If administered directly into the jejunum (i.e. through an NJ, PEJ, or PEGJ tube), monitor for increased systemic effects. ²	Unlikely to need: licensed alternative available
Amlodipine	LICENSED oral solution (and suspension for 5mg/5ml) available, but <u>very</u> expensive. (5mg/5ml and 10mg/5ml, sugar free - 1 month expiry once opened, store in fridge)	If necessary, most tablet brands disperse in water easily in 1 to 5 minutes for oral or enteral tube use. ² Administration via NG/PEG tube – Flush the feeding tube after the dose with 20mL of water. ² Give immediately as the drug is light sensitive.	Unlikely to need: licensed alternative available

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Apixaban	No licensed oral liquid available The SPC for Eliquis tablets states that the tablets may be crushed and suspended in water, 5% dextrose in water, or apple juice or mixed with apple puree and immediately administered orally. Alternatively, Eliquis tablets may be crushed and suspended in 60 mL of water and immediately delivered through a nasogastric tube. Crushed Eliquis tablets are stable in water, 5% dextrose in water, apple juice, and apple puree for up to 4 hours.	Licensed for administration through nasogastric tubes – administration through other types of enteral feeding tube would be outside the product license. Take care to ensure the whole dose is administered, and flush well after each dose. ²	Unlikely to need: licensed alternative available
Aripiprazole	LICENSED orodispersible tablets available, but expensive. Licensed liquid also available but is even more expensive.		Unlikely to need: licensed alternative available
Atorvastatin	LICENSED chewable tablets available GREY - Licensed oral solution available (20mg/5ml, Rosemont), but contains significant level of alcohol and costs approx £200 per month at dose of 20mg daily.	Film coated tablets can be crushed and mixed with water for enteral tube and oral use. Tablets are not very soluble and a residue may be left. Flush well after dosing. ² Give immediately as the drug is light sensitive.	Unlikely to need: licensed alternative available
Azathioprine	No licensed oral liquid available. Note that preferred strength of unlicensed oral suspension is 50mg/5mL as per RCPCH statement	Cytotoxic drug DO NOT CRUSH. Tablets have a film coating that prevents exposure to the cytotoxic medicine inside. ²	50mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that 20mg/5ml, 25mg/5ml & 100mg/5ml also in tariff. NB: Cytotoxic - Carers handling the suspension should wear gloves in case of contact with the medication
Bendroflumethazide	No licensed oral liquid available.	Disperse in water (disperses readily in 1-5mins) for oral or enteral tube use. Give immediately ²	2.5mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³
Betahistine	No licensed oral liquid available.	Crush tablets and mix with water (the drug is very soluble) for oral or enteral tube use. Give immediately ²	8mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 200ml ³ (costs >£100 for 200ml)
Bisacodyl	LICENSED suppositories available (5mg and 10mg) or consider senna liquid	The tablet is enteric coated and is designed to release the drug in the colon. Do not crush as it has an irritant effect on the stomach ²	Unlikely to need: licensed alternative available
Bisoprolol	No licensed oral liquid available. Consider switching to alternative betablocker as appropriate for indication e.g. atenolol (available as LICENSED liquid)	Crush tablets finely and mix with water for oral or enteral tube use. The lower strength tablets will disperse in 1 to 5 mins without crushing. The higher strength tablets should be crushed before mixing with water. Give immediately. Flush well after each dose. ²	2.5mg/5ml oral solution Minimum quantity 150ml ³ and 5mg/5ml oral suspension Minimum quantity 100ml ³ included in Part VIII B of Drug Tariff Note that other strengths also in tariff, but 2.5mg/5ml oral solution and 5mg/5mg oral suspension are most effective options.
Bumetanide	LICENSED oral solution SF (1mg/5ml) but extremely expensive approx. £200 for 150ml ³	If necessary, the tablets can be crushed and mixed with water for oral or enteral tube use. Give immediately. ²	Unlikely to need: licensed alternative available
Buprenorphine	LICENSED sublingual tablets (if the patient has a sufficiently moist mouth) and transdermal patches available	The sublingual tablets are not suitable to be administered via enteral feeding tube as the drug undergoes extensive first pass metabolism. ²	Unlikely to need: licensed alternative available
Canagliflozin	No licensed oral liquid available	Film coated, manufacturer states swallow whole. Advice from regional MI centre is that there is no pharmaceutical reason not to crush and disperse in water, but solubility of canagliflozin is poor so likely to disperse poorly. Advice is to crush and disperse in small amount of water and assess suitability of the solution for administration. Significant interaction with enteral feed or food unlikely.	No liquid in Drug Tariff
Candesartan	No licensed oral liquid available	The tablets can be crushed and dispersed in water for oral or enteral tube use. ² No information on use with feeding tubes.	No liquid in Drug Tariff
Captopril	LICENSED oral solution available, but expensive (~£100 per 100ml) AMBER 2 - Recommended strength locally is 25mg/5mL (5mg/5mL is RED and only for inpatient initiation) Expires 21 days after opening, 100ml pack size	If necessary, the tablets will disperse in water in 1 to 5 minutes for oral or enteral tube use. ² Concomitant food or milk can decrease captopril absorption. If clinical effect is insufficient, consider withholding enteral feed for half an hour before and half an hour after each dose (if on continuous nutrition, contact dietitian for advice). Flush well after each dose ²	Unlikely to need: licensed alternative available
Carbimazole	No licensed oral liquid available	Crush tablets and mix with water for oral or enteral tube use. Give immediately ²	10mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ (costs £85 for 150ml)
Carbocisteine	LICENSED sachets (750mg/10ml) and oral solution (250mg/5ml and 750mg/5ml) available.		Unlikely to need: licensed alternative available

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Carvedilol	No licensed oral liquid available	The tablets can be dispersed in water for oral or enteral tube use. They disperse in one to five minutes. Use immediately. ² If administered directly into the jejunum (i.e. through an NJ, PEJ, or PEGJ tube), monitor for increased systemic effects. Carvedilol has a high level of first pass metabolism, and when administered into the jejunum, can have increased absorption leading to greater clinical effects and adverse effects. Giving carvedilol with food may help to decrease the risk of orthostatic hypotension by reducing the rate at which the medication is absorbed. ²	5mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ - No information on administering suspension via enteral feeding tube ²
Chloral hydrate	Locally recommended preparation is 500mg/5mL oral solution as per RCPCH⁴ (Licensed 500mg/5ml oral solution £244 for 150ml) ³	For enteral feeds: Local recommendation is to use the licensed oral solution (recommended strength is 500mg/5mL). It is light sensitive, so give immediately. ²	Unlikely to need: licensed alternative available
Chlorothiazide	RED medicine (Suspension 250mg/5ml for paediatric use only - available as an unlicensed product) - refer back to specialist.		
Chlorpromazine	LICENSED oral solution available (25mg/5ml and 100mg/5ml - 6 month expiry once opened). Note that Pinewood Healthcare make a 25mg/5ml oral solution, but it only has a 1 month expiry once opened)	Chlorpromazine has been reported as being incompatible with some enteral feeds, so ensure enteral feeding tubes are flushed well before and after each dose. ² Carers should avoid direct contact with chlorpromazine as contact sensitisation may occur, therefore the tablets should not be crushed. ²	Unlikely to need: licensed alternative available
Citalopram	LICENSED oral drops (40mg/ml) available. Note that 8 drops (16mg) is equivalent to 20mg tablet dose and 16 drops (32mg) is equivalent to 40mg tablet dose.		Unlikely to need: licensed alternative available
Clindamycin	No licensed oral liquid. Where clinically appropriate, change to an alternative antibiotic available as a liquid or dispersible tablet.	Open the capsules and disperse in water. Give immediately. ² Avoid inhalation of capsule contents. ³ The capsule contents taste extremely unpleasant and may be unpalatable for oral administration in patients with swallowing difficulties. The capsule contents can be mixed with grape juice or maple syrup. ²	75mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Clobazam	LICENSED oral suspension available. Expensive, £95 for 150ml. (10mg/5ml - Expires 28 days after opening) Note that the 5mg/5ml strength is non formulary in Nottinghamshire - rationalised to one strength for safety reasons (APC Sept14)	The tablets can be dispersed in water for oral or enteral tube use. They disperse in one to five minutes. Use immediately. And ensure whole dose is administered. Flush well. Crushed tablets taste unpleasant. ²	Unlikely to need: licensed alternative available
Clomipramine HCl	No licensed oral liquid available. Consider switching to alternative : amitriptyline, lofepramine, trazodone (available as LICENSED liquids)	Capsules can be opened and the contents mixed with water for oral or enteral tube use. ² DO NOT Crush the MR tablets If administered directly into the jejunum (i.e. through an NJ, PEJ, or PEGJ tube), monitor for increased systemic effects. ²	50mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Costs £45 for 100ml
Clonazepam	LICENSED oral solution available (local recommended strength is 2mg/5ml - expires 1 month after opening) Licensed liquid contains ethanol, but local paediatric pharmacists consider ethanol content of 2mg/5mL oral solution to be within acceptable limits for children. Cost >£100 for 150ml	For administration via NG / PEG tubes use the oral solution which is licensed for administration via enteral feeding tubes (non-PVC tubes only). The tube should be flushed well with three separate flushes of at least 5mL water each, as the solution is oily and can adsorb to the inside of the feeding tube. The tablets can be dispersed in at least 30mL of water for administration ² For NJ or PEJ feeding contact practice pharmacist (see NEWT guidelines).	Unlikely to need: licensed alternative available
Clonidine	LICENSED oral solution available (but is RED on the Nottinghamshire Formulary) (50micrograms/5ml, expires 1 month after opening) Note that transdermal patches are not licensed in the UK	The tablets have been crushed by some centres, but there is little information on this. ²	Unlikely to need: licensed alternative available
Clopidogrel	No licensed oral liquid available	The tablets can be crushed and dispersed in water for oral or enteral tube use. Most brands disperse in one to five minutes without crushing, however some take longer. ² No information about using the solution or the suspension via enteral feeding tubes has been located ²	75mg/5ml oral solution included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Note that 1mg/ml & 75mg/5ml oral suspension also in tariff, but 75mg/5ml oral solution is more cost effective. NUH 25mg/5ml for paediatric use only.

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Co-Careldopa	No licensed oral liquid available. Consider switching to LICENSED Co-beneldopa - capsules/dispersible tablets. (Dose conversion table available on NEWT Guidelines)	The standard Sinemet® tablets will disperse in water down enteral feeding tubes. Lower strengths disperse within one minute. The 25/250 strength disperse in one to five minutes. Give immediately ² (Info only available for Sinemet brand) Do NOT crush MR tablets. ²	25mg/100mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that 12.5mg/50mg/5ml oral suspension also in tariff, but 25mg/100mg/5ml strength is more cost effective.
Colecalciferol	Review prescribing and monitoring of patient in line with the Adult or Child Nottinghamshire Vitamin D guideline. Vitamin D for prevention / maintenance should be purchased over the counter unless exception criteria met as per CCG position statements. LICENSED products available - details in guideline and on Nottinghamshire Formulary.		
Cyclizine	No licensed liquid. Consider switching to alternative anti-emetic: promethazine, metoclopramide or domperidone (available as LICENSED liquids)	If absolutely necessary, crush tablets and disperse in water for oral or enteral tube use. Protect from light. The crushed tablets have a bitter taste. ² Administer immediately.	Unlikely to need: licensed alternatives available
Dabigatran	No licensed oral liquid available. Consider edoxaban, rivaroxaban or apixaban as licence covers crushing tablets.	Dabigatran capsules should not be opened. The capsule shell is specially formulated to release slowly at the correct point in the gastrointestinal tract. The pellets inside the shell are designed to create an acidic micro-environment to improve drug dissolution and absorption. Opening the capsules may greatly affect the oral bioavailability of the drug, with a risk of increased side effects (i.e. bleeding), therefore this should never be done. ²	No liquid in Drug Tariff
Dantrolene	No licensed oral liquid available.	The capsules can be opened, and the contents dispersed in water or acidic fruit juice (e.g. orange) for oral or enteral tube use. ²	25mg/5ml or 100mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that 10mg/5ml oral suspension also in tariff, but 25mg and 100mg/5ml are more cost effective.
Dapagliflozin	No licensed oral liquid available	Film coated, manufacturer states swallow whole. Advice from regional MI centre is that there is no pharmaceutical reason not to crush and disperse in water. Advice is to crush and disperse in small amount of water and assess suitability of the solution for administration. Significant interaction with enteral feed or food unlikely.	No liquid in drug Tariff
Dexamethasone	LICENSED soluble tablets and oral solution available. 2mg soluble tablets and 2mg/5ml oral solution are most cost effective strengths. Expiry of oral solution once opened 1 to 3 months depending on manufacturer.	If absolutely necessary, tablets can be crushed and dispersed in water. Care should be taken not to inhale the dust. ² Enteral tubes - use soluble tablets or oral solution. ² It may be preferable to use soluble tablets or the crushed tablets rather than the liquid for intrajejunal administration. ²	Unlikely to need: licensed alternative available
Diazepam	LICENSED oral solution, oral suspension and rectal solution tubes available.	For enteral administration: Use the oral solution, and dilute with water before administration to reduce viscosity and tube binding. ²	Unlikely to need: licensed alternative available
Diclofenac	LICENSED suppositories available. If liquid needed consider alternative NSAID (e.g. ibuprofen suspension 100mg/5ml). Note that diclofenac dispersible tablets have been discontinued.		Unlikely to need: licensed alternatives available
Diltiazem	No licensed oral liquid available. Where clinically appropriate, consider changing to an alternative once daily calcium-channel blocker such as amlodipine.	Note that all diltiazem tablets and capsules are labelled modified release, but the 60mg preparations are not slow-release and can be crushed for oral or enteral tube use. ² Patients on once or twice-daily modified-release preparations may need to be converted onto three-times-daily doses of the generic preparation SR capsules can be opened and the beads mixed with water or soft food (do not crush the capsule contents). ² See NEWT guidelines for more brand specific information with regards to enteral tube administration.	60mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Dipyridamole	LICENSED oral suspension available (50mg/5ml or 200mg/5ml - expires 1 or 2 months after opening depending on manufacturer) Dipyridamole suspension is not licensed for use post stroke. Consider switch to CLOPIDOGREL if appropriate.	For patients with wide-bore tubes, open the capsules and disperse the contents in water for administration. Do not crush the granules. Flush well as there is a potential for the granules to block enteral feeding tubes. ²	Unlikely to need: licensed alternative available
Donepezil	LICENSED orodispersible tablets available (5mg and 10mg tablets). 5mg tablets more cost effective. LICENSED oral solution also available (1mg/ml), but is GREY -Non formulary as it is much more expensive than orodispersible tablets.	If necessary, the tablets can be crushed and mixed with water for oral or enteral tube use. ²	Unlikely to need: licensed alternative available

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Dosulepin	<p>GREY - Non formulary. Dosulepin is no longer recommended for the treatment of depression due to the high risk of fatality in overdose and increased cardiac toxicity. Consider switching to alternative antidepressant that is available as a liquid or orodispersible formulation. The choice of alternative antidepressant should be based on individual patient factors. Note amitriptyline is also non formulary for depression/anxiety due to toxicity in overdose and is therefore not an appropriate alternative.</p> <p>Link to ICB dosulepin review and deprescribing advice</p>		
Doxazosin	No licensed oral liquid available	<p>Tablets disperse within 2 minutes in 10mL of water to give a coarse dispersion; this flushes via an 8Fr NG tube without blockage (generics only, use deionised water for Cardura brand). Give immediately. [ref: <i>Handbook of Drug Administration via Enteral Feeding Tubes, accessed online via Medicines Complete, Sept 2020</i>] Do not crush or divide MR tablets. ²</p>	<p>4mg/5ml oral solution included in Part VIII B of Drug Tariff Minimum quantity 150ml ³</p> <p>Note 1mg/5ml oral suspension or solution and 4mg/5ml suspension also in tariff, but are not as cost effective.</p>
Duloxetine	No licensed oral liquid available	<p>The capsules can be opened and their contents mixed with apple juice or apple sauce. The capsules contain enteric-coated beads which should not be chewed or crushed. The mixture should be given immediately. ²</p> <p>No information on giving duloxetine via enteral feeding tubes has been located.</p>	No liquid in Drug Tariff
Edoxaban	<p>No licensed oral liquid available. SPC for Lixiana advises that for patients unable to swallow, tablets may be crushed and mixed with water/apple puree and immediately administered orally. Alternatively, tablets may be crushed and suspended in water and immediately delivered through a gastric tube followed by flushing with water.</p> <p>Crushed Lixiana tablets are stable in water and apple puree for up to 4 hours.</p>		Unlikely to need as tablets are licensed to be crushed.
Empagliflozin	No licensed oral liquid available	<p>Film coated, manufacturer states swallow whole. Advice from regional MI centre is that there is no pharmaceutical reason not to crush and disperse in water. Advice is to crush and disperse in small amount of water and assess suitability of the solution for administration.</p> <p>Significant interaction with enteral feed or food unlikely.</p>	No liquid in drug Tariff
Enalapril	<p>No licensed oral liquid available. Consider switching to alternative ACE inhibitor.</p>	<p>Crush tablets and disperse in water for oral or enteral tube use. Without crushing some brands will disperse in around five minutes. Give immediately. ² The crushed tablets may have a bitter aftertaste. ²</p>	<p>10mg/5ml-oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³</p> <p>Note other strengths are also in tariff, but are not as cost effective.</p>
Ergocalciferol	<p>GREY - Non formulary. Review prescribing and monitoring of patient in line with the Nottinghamshire Vitamin D guideline. Vitamin D for prevention / maintenance should be purchased over the counter unless exception criteria met as per CCG position statements. LICENSED products available - details in guideline and on Nottinghamshire Formulary.</p>		
Ertugliflozin	No licensed oral liquid available	<p>Film coated, manufacturer states swallow whole. Advice from regional MI centre is that there is no pharmaceutical reason not to crush and disperse in water. Advice is to crush and disperse in small amount of water and assess suitability of the solution for administration.</p> <p>Significant interaction with enteral feed or food unlikely.</p>	No liquid in drug Tariff
Ferrous Sulfate	<p>LICENSED oral drops available (125mg (25mg iron)/5ml, Ironorm[®]) but they are GREY - Non formulary and it is more cost effective to switch to ferrous fumarate liquid or Sytron (sodium feredate).</p>	<p>Convert to appropriate dose of ferrous fumarate liquid which can be diluted with water immediately prior to administration if desired to reduce the viscosity of the liquid. Dilution with water may reduce side effects when ferrous fumarate liquid is given through enteral tubes terminating in the jejunum. The liquid should NOT be diluted with milk. ²</p> <p>Higher doses may be needed when given through enteral tubes terminating in the jejunum. Some iron preparations have been reported as being incompatible with some enteral feeds, so ensure enteral feeding tubes are flushed well before and after each dose. ²</p>	Unlikely to need: licensed alternative available

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Flecainide	No licensed oral liquid available	If necessary, crush and disperse tablets in water (info for generics only). Give immediately [ref: Handbook of Drug Administration via Enteral Feeding Tubes, accessed online via Medicines Complete, Sept2020] Food reduces the rate but not the extent of absorption. ³ NB: May have an anaesthetic effect on the tongue so care should be taken in patients with swallowing difficulties. ² If giving via enteral feeding tube, always flush with de-ionised water and do not mix with other medications prior to administration. ²	25mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 200ml ³ Flecainide acetate 25mg/5mL oral solution is RED , but available for patients under the care of NUH paediatric cardiology. (NB: Rosemont brand NOT suitable for neonates) Note that 10mg/5ml oral suspension and 25mg/5ml oral solution also in tariff, but are not as cost effective.
Fludrocortisone Acetate	No licensed oral liquid available	The tablets will disperse in water for oral or enteral tube use. They disperse within one minute. Flush the feeding tube well after administration. ²	100micrograms/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ 50micrograms/5ml also available, but not as cost effective.
Fluoxetine	LICENSED oral solution (sugar free is not as cost effective) and dispersible tablets available.	If giving via enteral feeding tube, use the liquid and dilute with the same volume of water. ²	Unlikely to need: licensed alternative available
Folic Acid	LICENSED oral solution available (2.5mg/5ml) 5mg/5ml also available, but not as cost effective as 2.5mg/5ml.	If necessary, the tablets can be crushed and dispersed in water for oral or enteral tube use. Give immediately. ² The oral solution can be diluted with water to reduce the osmolality if desired when giving into the jejunum, however this is outside the licence. ²	Unlikely to need: licensed alternative available
Furosemide	LICENSED oral solution available: 20mg/5ml, 40mg/5ml (sugar-free) and 50mg/5ml NB: Some brands contain alcohol 50mg/5mL (licensed) is the preferred strength for paediatric patients (as this minimises ethanol exposure)	There is an oral solution which is licensed for administration via NG and PEG tubes (Frusol®). The solution does not need to be diluted before administration. ² See individual SPC for flushing details For NJ/PEJ/PEGJ tubes, use the oral solution and dilute with same volume of water before administration. Absorption may be reduced when administered directly to jejunum. ²	Unlikely to need: licensed alternative available
Gabapentin	LICENSED oral solution available, but is expensive. (50mg/ml - expires 1 month after opening) Costs approx. £65 for 150ml Consider continued need if unable to swallow capsules or LICENSED alternative for neuropathic pain e.g. amitriptyline oral solution	Administration via NG / PEG tubes The oral solution (Rosemont or Colonis brands only) is licensed for administration via enteral feeding tubes. ² See individual SPC for flushing details. For NJ/PEJ/PEGJ tubes open capsule, dissolve in water and give immediately. No information on administering oral solution via tubes to the jejunum. ²	Unlikely to need: licensed alternative available
Gliclazide	No licensed oral liquid available Consider switching to insulin ²	For non-MR tablets: Crush the tablets well (as the drug is practically insoluble) and mix with water or orange juice for oral or enteral tube use. ² Do not crush MR tablets²	80mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Note 40mg/5ml oral suspension also in tariff, but 80mg/5ml is more cost effective.
Haloperidol	LICENSED oral solution available various strengths and manufacturers		Unlikely to need: licensed alternative available
Hydrocortisone	LICENSED soluble 10mg tablets available (>£50 for 30). Note that licensed granules in capsules for opening are AMBER 2 - restricted for cortisol replacement therapy of infants and young children with adrenal insufficiency (see product information for administration instructions). No licensed oral liquid available. Note that muco-adhesive buccal tablets are licensed for mouth ulcer treatment only and must NEVER be used for adrenal replacement therapy (see MHRA alert Dec18)	The standard-release tablets are insoluble but will disperse in water for oral or enteral tube use. They disperse within one minute. ² Do not crush MR preparations²	5mg or 10mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Hydroxycarbamide	RED medicine - refer back to specialist. Cytotoxic drug DO NOT CRUSH OR OPEN CAPSULE²		
Hydroxychloroquine	No licensed oral liquid available	The tablets can be crushed and dispersed in water for oral or enteral tube use. Give immediately. ²	200mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Hyoscine BUTYLbromide	No licensed oral liquid available. Consider switch to hyoscine HYDROBROMIDE	Tablets are coated so will not disperse easily in water. Do not crush the tablet ² Not suitable for administration via feeding tube. ²	10mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Sugar free oral solution also available but is more expensive.

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Hyoscine HYDRObromide	LICENSED chewable tablets and patches (Scopoderm) available.	The tablets may be sucked if the patient is able, and absorbed through the lining of the mouth, although the level of absorption may vary, particularly in patients with little saliva. ² The tablets can be dissolved in water for administration via enteral tube, but absorption may vary. ²	Unlikely to need: licensed alternative available
Imipramine HCl	LICENSED oral solution available (25mg/5ml, - expires 30 days after opening) Cost £250 for 150ml or consider alternative tricyclic antidepressant.	The tablets may be crushed and mixed with water for oral or enteral tube use. Flush well after dosing as the coating has the potential to block enteral feeding tubes. ² If administered directly into the jejunum (i.e. through an NJ, PEJ, or PEGJ tube), monitor for increased systemic effects. ²	Unlikely to need: licensed alternative available
Indapamide	No licensed oral liquid available	Disperse conventional-release tablets in water immediately prior to administration. ² DO NOT crush slow release formulations. ² Consider switch to IR indapamide (1.5mg SR is equivalent to 2.5mg IR) or bendroflumethiazide. For patients with tubes terminating in the stomach, the standard tablets can be dispersed in water. Administration via tubes terminating in the jejunum is not appropriate for indapamide as absorption will be greatly reduced. ²	2.5mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Cost >£113 for 150ml
Indometacin	LICENSED suppositories available. Consider switching to paracetamol or an alternative NSAID (NB: consider GI/CV safety of different NSAIDs)		Unlikely to need: licensed alternative available
Irbesartan	No licensed oral liquid available Consider switching to alternative ACEI or ARB	Crush tablets and mix with water for oral or enteral tube use. Give immediately ² Without crushing they disperse in around five minutes. ² Flush enteral tube well after each dose ²	No liquid in Drug Tariff
Isosorbide mononitrate	No licensed oral liquid available GTN patch may be an alternative.	Standard-release tablets can be crushed and dispersed in water for oral or enteral tube use. There may be an increased rate of absorption and increased side effects. Consider reducing the dose and giving doses more frequently if this occurs. ² Do not crush or open MR preparations , but if tablets are scored they can be halved. ²	20mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Ketamine	AMBER for Palliative care after specialist initiation RED Drug for all other indications- refer back to specialist. Use Ketamine 50mg/5ml oral suspension included in Part VIII B of Drug Tariff (unlicensed), minimum quantity 200ml (solution is more expensive)		
Lansoprazole	LICENSED orodispersible tablets available. License covers administration via NG tube. Most brands of capsules can be opened and beads swallowed without crushing, or can be mixed with food or drink. The granules must not be crushed or chewed. See SPC for information.		Unlikely to need: licensed alternative available
Levetiracetam	LICENSED oral solution available (100mg/ml). Granules (Desitrend) also available but are more expensive than liquid. Desitrend are licensed to be administered via enteral feeding tube. See SPC for information	Oral solution can also be administered via enteral tube but is not licensed ²	Unlikely to need: licensed alternative available
Levomepromazine	Palliative care use only. No licensed oral liquid. Consider switching to alternative antipsychotic if appropriate (e.g. haloperidol, chlorpromazine, sulphiride available as LICENSED liquids) Or switch to s/c injection as per Notts APC End of life guideline.	The tablets can be dispersed in water if necessary for oral or enteral tube use. They disperse immediately. ² 25mg tablets are quarter scored and can be split if the patient, carer or pharmacy is able. Ensure directions are clearly explained to patient.	2.5mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that 6mg/5ml oral suspension also in tariff but the 2.5mg/5ml oral suspension is the most cost effective
Levothyroxine	LICENSED oral solution available (100, 50 and 25 micrograms/5ml), but is very expensive (£150+ per month). Review MHRA advice for patients who experience symptoms on switching between different levothyroxine products.	If necessary, tablets can be crushed and dispersed in water for oral or enteral tube use. Give immediately. ² For patients receiving levothyroxine through enteral feeding tubes long-term, consider holding the feed for one hour before and one hour after each dose to minimise feed interactions. ² Administration - NJ / PEJ / PEGJ tubes: There is some indication that absorption of levothyroxine is reduced when administered through enteral feeding tubes terminating in the jejunum. Monitor thyroid function, consider increasing the dose if necessary, and take care when switching between jejunal and gastric-terminating tubes. ²	Unlikely to need: licensed alternative available

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Lisinopril	Consider switching to alternative ACE inhibitor. LICENSED oral solution available (5mg/5ml), costs >£150 for 150ml Lisinopril oral solution is absorbed to a lesser extent than lisinopril tablets. When converting patients to and from the liquid, monitor blood pressure and consider a dose alteration if necessary. ²	The tablets can be dispersed in water for oral or enteral tube use. The drug is soluble, and the tablets disperse in one to five minutes. ²	Unlikely to need: licensed alternative available
Lofepramine	LICENSED oral suspension available (70mg/5ml), but is expensive (~£140 for 150ml)	For enteral administration Rosemont do not recommend diluting the suspension with water before administration as this may destabilise the suspension. If administered directly into the jejunum (i.e. through an NJ, PEJ, or PEGJ tube), monitor for increased systemic effects. Lofepramine has a high level of first pass metabolism so can have increased absorption leading to greater clinical effects and adverse effects. ² The tablets are not suitable for crushing. ²	Unlikely to need: licensed alternative available
Loperamide	LICENSED oral solution (1mg/5ml) and orodispersible tablets available. DO NOT DILUTE	Opening capsules is not recommended as it can change the bioavailability and will block feeding tubes. ² Loperamide liquid is suitable for administration through enteral tubes terminating in the jejunum. The liquid should be given undiluted to facilitate its dose dependant effect on motility. Flushing should still occur. ²	Unlikely to need: licensed alternative available
Lorazepam	Tablets dissolve under the tongue if patient has sufficiently moist mouth ² LICENSED oral solution (1mg/mL) available if absolutely necessary, but expensive (>£100 for 150ml). 150ml pack expires 90 days after first opening.	Tablets dissolve under the tongue if patient has sufficiently moist mouth ² For oral and enteral tube use: If necessary, crush tablets and mix with water. Give immediately. Without crushing they disperse in one to five minutes. ²	Unlikely to need: licensed alternative available
Losartan	No licensed oral liquid available	For oral and enteral tube use: The tablets can be crushed and mixed with water immediately prior to administration. ²	50mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³
Magnesium	1st choice: LICENSED oral sachets (Magnesium aspartate (magnesium 10mmol) oral powder sachets (Magnaspartate)) 2nd choice: LICENSED chewable tablet (magnesium glycerophosphate 97.2mg = 4mmol magnesium per tablet) 3rd choice: LICENSED magnesium hydroxide oral suspension		Unlikely to need: licensed alternative available
Mebeverine	Consider if still needed. LICENSED oral suspension available (50mg/5ml), but extremely expensive (>£700 per month DT Mar22). Combined mebeverine and ispaghula husk (Fybogel Mebeverine) may be an option if a laxative is also needed (note GREY on formulary - speak to your medicines management pharmacist as an exception may be made if only other option is the oral suspension)	Do not crush or chew tablets due to unpleasant taste. Do not crush or open MR preparations as they will lose MR properties. (SPC)	Unlikely to need: licensed alternative available
Melatonin	Licensed tablets, MR tablets and 1mg/ml oral solution (liquid is very expensive) but check licensing and formulary status (varies depending on indication). NB: Changing between immediate release and modified release preparations is not recommended without discussion with the specialist.	For oral use: Circadin tablets may be halved using a tablet cutter and maintain slow release properties. NON-MR capsules (unlicensed) may be opened and contents mixed with water, milk, yoghurt or fruit juice. ² For oral and enteral tube use (if liquid not suitable): Circadin tablets may be crushed and mixed with water. Modified release characteristics are then lost and it acts like an immediate release preparation. Flush tube well after administration.	Various strengths available in tariff, but 1mg/mL is the preferred strength locally for consistency.
Memantine	LICENSED oral solution or orodispersible tablets (Valios) available <i>Oral solution is more cost effective than orodispersible tablets</i>		Unlikely to need: licensed alternative available
Mercaptopurine	LICENSED oral suspension available (20mg/ml Xaluprine®. Expires 56 days after opening) Costs ~£170 for 100ml NB: Cytotoxic - carers handling the suspension should wear gloves in case of contact with the medication	Cytotoxic drug DO NOT OPEN CAPSULES	Unlikely to need: licensed alternative available
Metformin	LICENSED oral solution available (500mg/5ml, expires 60 days after opening) Other strengths available, but 500mg/5ml is by far the most cost effective option ³	Oral solution (Colonis brand) is licensed for administration via enteral feeding tubes. Flush the feeding tube twice with 10mL of water each after each dose. ^{SPC}	Unlikely to need: licensed alternative available

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Methotrexate	LICENSED oral solution available, but expensive (Rosemont, 2mg/ml - available as 35ml and 65ml. Expires 3 months after opening) Costs >£100 for 65ml NB: Carers handling the suspension should wear gloves in case of contact with the medication	Cytotoxic drug DO NOT CRUSH TABLETS	Unlikely to need: licensed alternative available
Methyldopa	No licensed liquid. Where clinically appropriate, change to an alternative antihypertensive therapy.	Tablets can be crushed and dispersed in water immediately prior to administration. They are film coated and not very soluble. The crushed tablets have an unpleasant taste ² Enteral tubes: Take care to crush the tablets well, and to flush the tube well to prevent blockage. Methyldopa interacts with Ensure [®] , Ensure Plus [®] , and Osmolite [®] feeds. Feeds should be stopped for two hours before and one hour after administration (if on continuous nutrition, contact dietician for advice). ²	No liquid in Drug Tariff
Methylphenidate	No licensed liquid	Some modified-release capsule brands (Equasym [®] XL and Medikinet [®] XL) can be opened and the contents sprinkled onto a small amount of apple sauce or yoghurt and taken immediately (licensed). This should be followed by a drink to ensure all the medicine reaches the stomach. The contents of the capsules should not be chewed or crushed. Do not give the MR preparation via enteral tube. ² The standard release tablets can be crushed and mixed with water for oral or enteral tube use. Do not crush the modified release tablets or open the modified-release capsules. ²	5mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³
Metoprolol	No licensed liquid Consider switching to alternative betablocker e.g. atenolol which is available as LICENSED liquid	For non-MR tablets: The tablet can be crushed and dispersed in water for oral or enteral tube use. They disperse very slowly. ² DO NOT Crush the MR tablets	Most cost effective option is 12.5mg/5ml oral suspension Minimum quantity 100ml ³ 50mg/5ml oral solution also included in Part VIII B of Drug Tariff, but is significantly more expensive. Minimum quantity 150ml ³ Note 12.5mg/5ml oral solution also in tariff, but not as cost effective
Midodrine	No licensed liquid AMBER 2 after consultant initiation.	The tablets can be crushed and mixed with water for oral or enteral tube use. ² Give immediately.	No liquid in drug tariff
Mirtazapine	LICENSED orodispersible tablets available if patient can manage them Licensed oral solution (15mg/ml sugar free) also available, but orodispersible tablets are significantly more cost effective. Oral solution is ~£100 per 66ml.	The standard tablet, when crushed, has a bitter taste and an anaesthetic effect on the mouth. ² Mirtazapine is mostly absorbed in the duodenum. Mirtazapine may not be fully absorbed if given through an enteral tube terminating in the jejunum. Any patient requiring mirtazapine through an enteral tube terminating in the jejunum should be reviewed, and if the situation is long-term, consideration should be given to using a different treatment. ²	Unlikely to need: licensed alternative available
Modafinil	No licensed liquid AMBER 2 after specialist initiation.	Crush tablets and mix with water for oral or enteral tube use. Give immediately. ²	No liquid in drug tariff
Morphine	LICENSED preparations available (solution, sachets and suppositories). Zomorph capsules are licensed to be opened and the contents administered directly in semi-solid food (puree, jam, yoghurt) or via wider bore gastric or gastrostomy tubes (but not recommended*). The capsule and contents should not be crushed or chewed - may lead to rapid release of potentially fatal dose of morphine. See SPC for details.	When an immediate-release product is required, administer 10mg/5ml morphine sulphate oral solution (e.g. Oramorph [®]). This is the preferred enteral method of administering morphine. *The use of controlled-release preparations of morphine via enteral feeding tubes is not usually recommended due to the potential for accidental morphine overdose if any of the dose is left in the tube and subsequently administered to the patient with the next dose. ²	Unlikely to need: licensed alternative available
Naproxen	LICENSED sugar free suspension (250mg/5ml*) or effervescent tablets (Stirlescent 250mg Effervescent). Both are expensive, so if liquid needed consider alternative NSAID (e.g. ibuprofen suspension 100mg/5ml) *125mg/5ml also available but is more expensive	If considering enteral tube administration - consider switching to an alternative non-steroidal anti-inflammatory drug available via a different route. ²	Unlikely to need: licensed alternative available
Nifedipine	No UK licensed liquid, but there is a German import (20mg/ml) which is likely to be expensive. Most practical solution is to switch to amlodipine (licensed liquid available) Short acting formulations of nifedipine are not recommended for angina or long term management of hypertension.	Modified release capsules can be opened and beads mixed with water for enteral tube or oral use (Do not crush as this will destroy their modified release properties) ² If giving via enteral tube, be sure to flush the enteral tube well after dose administration. ²	10mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ 5mg/5ml also available, but not as cost effective. Nifedipine 20mg/ml oral drops can be imported, but expensive (>£200 for 30ml)
Nitrazepam	GREY non formulary - Consider if still needed. Consider an alternative agent that is appropriate for the treatment indication.		

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Nitrofurantoin	LICENSED oral suspension available (25mg/5ml), but extremely expensive. Costs > £400 for 300ml! Consider alternative if clinically appropriate see NottsAPC guidelines ⁵	Do NOT crush the tablets or open the MR capsules, nitrofurantoin is an irritant ² Some brands of capsules (normal release) have been opened. ² Absorption is improved by concomitant food or milk. Manufacturer advises taking with food or milk. ^{SPC}	Unlikely to need: licensed alternative available
Nortriptyline	Licensed liquid extremely expensive (>£200 for 10mg/5ml or >£300 for 25mg/5ml for 250ml). Consider an alternative agent that is appropriate for the treatment indication.	Tablets can be crushed and mixed with water for enteral tube or oral use. They disperse in one to two minutes. ² Administration - enteral tubes No information on administering the oral solution via enteral feeding tubes has been located. If administered directly into the jejunum (i.e. through an NJ, PEJ, or PEGJ tube), monitor for increased systemic effects. ²	Unlikely to need: licensed alternative available
Olanzapine	LICENSED orodispersible sugar free* tablets available (same dose and frequency as coated tablets). Can be placed in the mouth where it will rapidly disperse in saliva, or dispersed in full glass of water, orange juice, apple juice or milk. Olanzapine may be irritant to the skin and eyes, so take precautions to avoid contact (e.g. wear gloves). Note that oral lyophilisate is very expensive. *Non sugar-free tablets are much more expensive	Administration - enteral tubes Use the orodispersible tablets and disperse in water. ²	Unlikely to need: licensed alternative available
Omeprazole	(LICENSED): Most brands of capsules can be opened and beads swallowed without crushing, or can be mixed with food or drink - see SPC for detail LICENSED orodispersible tablets available if opening capsules is not an option or for enteral tubes. Disperse in water then mix with other juice/yoghurt if flavouring required. Mezzopram is preferred brand. LICENSED oral suspension is very expensive (>£200 for 75ml, 20mg/5ml) Advice for paediatric prescribing: See algorithm for review of children taking omeprazole liquid for advice on suitable paediatric preparations.	Mezzopram dispersible tablets are licensed for use through enteral feeding tubes.	Unlikely to need: licensed alternative available
Oxybutynin	LICENSED patches available (Kentera, 3.9mg/24 hours - replace twice weekly) Oral solution available, but very expensive so only to be used if patches (and solifenacin liquid) not appropriate. (5mg/5ml & 2.5mg/5ml oral solution sugar free costing >£200 for 150ml - 5mg/5ml most cost effective) Oral solution contains sorbitol, if using for children monitor for side effects (most commonly diarrhoea / abdominal discomfort) especially at higher doses and in those on multiple liquid medicines. Use 5mg/5ml to minimise sorbitol intake.	Do not halve, crush or chew the prolonged release tablet. ² The normal release tablets can be crushed and mixed with water for enteral tube or oral use. ² Give immediately	Unlikely to need: licensed alternative available
Paracetamol	LICENSED preparations available (soluble tablets (NB: Sodium content), suspension and suppositories.	For enteral tubes: the soluble tablets are preferable to the suspension which is hyperosmolar and may cause diarrhoea when administered via enteral tubes terminating in the jejunum. However the soluble tablets contain a lot of sodium which may be a problem in some patients. ²	Unlikely to need: licensed products available
Penicillamine	Amber 1 rheumatology RED for Wilson's Disease. No licensed liquid available, seek advice from specialist.		No liquid in Drug Tariff
Perindopril ARGININE	GREY - Non formulary No licensed liquid available. Switch to perindopril erbumine (note that 2.5mg perindopril arginine is equivalent to 2mg perindopril erbumine). ²	Owing to the lack of data consider using another ACE inhibitor where data is available or switch to perindopril erbumine. ²	See perindopril erbumine below

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Perindopril ERBUMINE	No licensed liquid	Tablets can be crushed and mixed with water for enteral tube or oral use. ² Give immediately Perindopril erbumine should be taken before food, so withhold enteral feeds for at least half an hour before and half an hour after administration (if on continuous nutrition, contact dietician for advice). ² Perindopril erbumine may not be effective when administered through enteral tubes terminating in the jejunum due to decreased absorption. ²	Perindopril erbumine 4mg/5ml oral solution included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Note that oral suspension is also in tariff but the solution is more cost effective.
Phenobarbital	Consider LICENSED 15mg/5ml elixir (NB Contains 38% v/v ethanol). Use alcohol free 50mg/5ml unlicensed liquid for children (50mg/5ml is standard strength used in Nottinghamshire).	Tablets can be crushed and mixed with water for enteral tube or oral use (if liquid not suitable). ² Give immediately	Alcohol free unlicensed specials available 50mg/5ml oral suspension (specify alcohol free) included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Solution also available - similar price per ml, minimum quantity is 100ml
Phenytoin	LICENSED preparations available (30mg/5ml oral suspension * and 50mg chewable tablets (Epanutin Infatabs)). Care is needed when switching between different phenytoin preparations - *90mg liquid equivalent to 100mg tablets, capsules or injection, but monitoring necessary.	For enteral tubes - absorption can be very unpredictable so give by parenteral injection or choose an alternative treatment if possible. If necessary, can give via NG or PEG tube, mix suspension with equal volume water and flush with 30-60mL water before and after administration. Not advisable to give via NJ/PEJ or PEGJ tubes. See NEWT guidelines and SPC for more detail.	Unlikely to need: licensed alternative available
Potassium Acid Phosphate = Potassium dihydrogen Phosphate	RED - high risk concentrated product. Refer requests to prescribe back to specialist. No licensed oral liquid available		
Potassium Chloride	LICENSED preparations available: Sando K (1 tablet = 12 mmol potassium) effervescent tablets Kay-Cee-L (1ml = 1mmol potassium) oral solution, dilute before use - contains sorbitol	Use Sando K or Kay-Cee-L oral solution. Kay-Cee-L is highly concentrated and contains sorbitol so dilute each dose with 60-90ml water before administration. ² Do not crush modified release preparations.	Unlikely to need: licensed alternative available
Pravastatin	No licensed liquid available. Consider switch to atorvastatin chewable tablets.	Tablets can be crushed and mixed with water for enteral tube or oral use. ² The drug is very soluble. Give immediately	Unlikely to need: licensed alternatives available
Primidone	No licensed liquid available	Tablets can be crushed and mixed with water for enteral tube or oral use. ² Give immediately	50mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Note that 62.5mg/5ml & 250mg/5ml oral suspension also in tariff, but 50mg/5ml is more cost effective.
Pregabalin	LICENSED oral solution sugar free is available (20mg/ml). Pack size is 473ml (£86). Expiry is as per manufacturer's even after opening.		Unlikely to need: licensed alternative available
Procyclidine	LICENSED oral solution sugar free available (2.5mg/5ml and 5mg/5ml)		Unlikely to need: licensed alternative available
Propranolol	LICENSED oral solution sugar free available. Locally recommended strength for oral solution is 50mg/5mL, but note that dermatology use 5mg/5mL (unlicensed) for infantile haemangioma. (3 month expiry after opening)	Do not crush / open modified release preparations. ² The oral solution can be diluted with water to reduce the osmolality if desired when giving into the jejunum (not licensed). ² Absorption of enteral propranolol can be increased by concomitant food or milk. It is therefore advisable to ensure that doses of propranolol are given at the same time of day each day in relation to feeds. ²	Unlikely to need: licensed alternative available
Pyridostigmine	LICENSED oral solution sugar free available (12mg/1ml)	Tablets can be crushed and mixed with water for enteral tube or oral use. ² Flush enteral tube well after administration. Give immediately	20mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that other strengths are listed in drug tariff, but are significantly more expensive.
Pyridoxine	No licensed liquid available	Tablets can be crushed and mixed with water for enteral tube or oral use. The 50mg tablets disperse in up to 5 minutes. ² Give immediately	100mg/5ml oral solution included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note 100mg/5ml oral suspension also in tariff, but oral solution is more cost effective.
Quetiapine	LICENSED oral suspension available (20mg/ml, Rosemont - Expires 28 days after first opening and must be stored in the fridge in original container to protect from light). Note: Expensive ~ £160 per 150ml	Tablets can be crushed and added to soft food (e.g. yogurt) for oral use, but they taste bitter. ² For enteral tubes, tablets can be crushed and mixed with water. Flush well after administration. ² No information on administering the oral suspension via enteral feeding tubes ²	Unlikely to need: licensed alternative available

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Quinine sulfate	No licensed liquid available. For cramps consider continued need and MHRA warning below RED (hospital only) for malaria	Crush the tablets well, and disperse in a large volume (e.g. 200mL) of water. The crushed tablets have a bitter taste which may be masked by mixing with syrup. Only use if absolutely necessary and swallowing problems are likely to be long-term. ² Enteral tubes: Crush the tablets well, and disperse in a large volume (e.g. 200mL) of water. Flush well to minimise blockage and irritancy, as the coating is likely to block narrow-bore enteral feeding tubes. ²	300mg/5ml oral suspension included in Part VIII B of Drug Tariff minimum quantity 150ml ³ 200mg/5ml suspension also available, but 300mg/5ml is more cost effective.
MHRA - Quinine: reminder of dose-dependent QT-prolonging effects; updated medicine interaction			
Ramipril	LICENSED oral solution sugar free available (2.5mg/5ml, Expires 1 month after opening and must be stored in the fridge) Note: Expensive - >£150 per 150ml	Rosemont oral solution is licensed to be administered via NG and PEG tubes ^{SPC}	Unlikely to need: licensed alternative available
Ranitidine	CURRENTLY UNAVAILABLE - See Joint Formulary for details and alternatives		Unlikely to need: licensed alternatives available.
Rivaroxaban	No licensed liquid available. License for Xarelto (rivaroxaban) includes crushing tablets and mixing with water or apple puree immediately prior to oral administration. The crushed tablet may also be given via gastric tube (reduced absorption if administered distal to the stomach) - see SPC for more detail.	Licensed for crushing and administering via NG or PEG tube. NOT suitable for administration via enteral feeding tubes terminating beyond the stomach (i.e. in the duodenum or jejunum) due to decreased absorption of the drug when given in this manner.	Unlikely to need as tablets are licensed to be crushed.
Selegiline	No licensed liquid, oral lyophilisates (Zelapar) discontinued.	If necessary for swallowing difficulty or enteral tube, tablets disperse in water within 1 minute. ²	No liquid in drug tariff
Sertraline	No licensed liquid. Consider switching to alternative SSRI. Fluoxetine (available as LICENSED liquid) or citalopram (available as LICENSED oral drops)	If no other option for oral administration, crush tablets and mix with food. ² NB: tablets taste bitter and have an anaesthetic effect on the tongue so care should be taken with hot meals after administration. ² Tablets disperse in water (takes 1 to 5 minutes) for administration via enteral tube. ²	50mg/5ml oral suspension (recommended strength locally) included in Part VIII B of Drug Tariff Minimum quantity 150ml ³ Note that 100mg/5ml suspension also in tariff, but 50mg/5ml is more cost effective. 25mg/5ml suspension is VERY expensive.
Sildenafil	Licensed chewable tablets are discontinued. Consider continued need if patient cannot swallow tablets. Oral suspension (Revatio 10mg/ml) is RED for use in paediatric intensive care.	The tablets can be crushed and mixed with water for enteral tube or oral use. ² Give immediately.	Unlikely to need
Simvastatin	Licensed oral suspension available, but is expensive (>£250 per month for 40mg daily). Consider switch to atorvastatin which is available as licensed chewable tablets.		Unlikely to need: licensed alternative available
Sodium Bicarbonate	Licensed oral solution available (420mg/5ml equivalent to 1mmol/ml), but is very expensive compared to opening the capsules.	The capsules can be opened and the contents mixed with water for enteral tube or oral use. ² Give immediately.	Unlikely to need: licensed alternative available
Sodium Valproate	LICENSED preparations available: Liquid, MR Granules and Crushable tablets - crush tablets and mix with water or soft food (e.g. yoghurt or jam) to mask bitter taste. For patients who are stabilised on modified-release formulations, use the modified-release granules. The granules should not be chewed or crushed. ²	For enteral tubes: Use the liquid (contains sorbitol). If necessary the liquid can be diluted immediately prior to administration. It should not be diluted in advance as this would dilute the preservative. ²	Unlikely to need: licensed alternative available
Solifenacin	LICENSED oral suspension sugar free available (1mg/ml) - for use in cases of swallowing difficulty, when oxybutynin patches are not suitable (especially at higher dose). There is also an oral solution available, but that is slightly more expensive than the suspension.	Crushing the tablets is not recommended as the powder released is irritant to the eyes. ²	Unlikely to need: licensed alternative available
Sotalol	No licensed liquid available Consider switching to alternative betablocker: atenolol or propranolol (available as licensed liquids)	The tablet can be crushed and mixed with water for enteral tube or oral use. ² The drug is very soluble. ² Can be administered through enteral tubes terminating in the jejunum.	25mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 200ml ³
Spironolactone	No licensed liquid available Unlicensed liquid medicine available for paediatrics (Amber 2): 10mg in 5mL (at SFH) 50mg in 5mL (at NUH) - Preferred strength for paediatric patients. It is recommended to use a product which does not contain propylene glycol	Crush tablets and mix with water for enteral tube or oral use. ² Give immediately.	5mg/5ml, 10mg/5ml, 25mg/5ml, 50mg/5ml & 100mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 125ml ³ Note that the oral solution is VERY expensive

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Tamoxifen	LICENSED oral solution sugar free available. (10mg/5ml, 3 months shelf life once opened)	Use licensed oral solution. WARNING: Carcinogenic Care should be taken when handling crushed or broken tablets. Avoid dust being inhaled or coming into contact with skin. Wear gloves, mask and eye protection if crushing tablets (not recommended). Without crushing tablets disperse in 2 to 5 minutes. ² WARNING Tamoxifen is a non-steroidal anti-oestrogen: Women of child bearing potential should not break or crush the tablets.	Unlikely to need: licensed alternative available
Tamsulosin	No licensed liquid available, consider changing to an alternative drug such as doxazosin.	If no other option, Modified Release capsules can be opened and the contents dispersed in cold water and swallowed immediately, do not crush or chew granules - not suitable for feeding tubes as likely to block them. ² The tablet is modified-release and should not be crushed. ²	400micrograms/5ml oral solution included in Part VIII B of Drug Tariff Minimum quantity 100ml. ³ Note that 400micrograms/5ml oral suspension also in tariff, but even more expensive than oral solution.
Temazepam	Consider if still needed. LICENSED oral solution sugar free available (10mg/5ml), but is expensive (>£180 for 300ml).	Use the oral solution for enteral tubes. The tablets should not be used for enteral tubes - they are quite insoluble and their use may lead to blockage. ² Temazepam may be less effective when administered through enteral tubes terminating in the jejunum. ²	Unlikely to need: licensed alternative available
Terbinafine	No licensed liquid available	Crush tablets and mix with water for enteral tube or oral use. ² Give immediately.	250mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 50ml ³
Thiamine	No licensed liquid available. Consider if still needed.	Crush tablets and mix with water for enteral tube or oral use. ² Give immediately.	100mg/5ml or 50mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that 100mg/5ml oral solution in tariff, but not as cost effective as 100mg/5ml oral suspension .
Ticagrelor	LICENSED orodispersible 90mg tablets available (same price as standard 90mg tablets) Licensed to be dispersed in water, taken orally or via NG tube ⁴ Brilique film coated tablets (60 mg and 90 mg) are licensed to be crushed and mixed with water taken orally and via NG tube. See SPC for details. ⁴		Unlikely to need: dispersing/ crushing tablets covered under licence for Brilique
Tizanidine	No licensed liquid available	Crush tablets and mix with water for enteral tube or oral use. ² Give immediately.	2mg/5ml oral solution included in Part VIII B of Drug Tariff Minimum quantity 100ml ³ Note that 2mg/5ml oral suspension also in tariff, but not as cost effective as oral solution.
Tolterodine	No licensed liquid available, consider alternative.	If continued therapy with tolterodine is indicated, disperse the tablets in water. ² Give immediately. No information available about whether tablets dispersed in water are likely to block enteral tubes. ² The modified-release capsules are not suitable for enteral tube administration. ² The preferred form of tolterodine for enteral administration is the standard tablets. ²	2mg/5ml oral suspension included in Part VIII B of Drug Tariff Minimum quantity 100ml ³
Topiramate	LICENSED sprinkle capsules available (sprinkle contents on small amount (teaspoon) of soft food and swallow immediately without chewing). LICENSED oral suspension is very expensive e.g. 100mg/5ml >£250 for 280ml ³	Enteral tubes: The tablets can be crushed and mixed with water. ² Give immediately. Sprinkle capsules not recommended for enteral tubes (even large bore) as may adhere to sides of tube and risk blockage). ² The crushed tablets have a bitter taste ² so sprinkle capsules are preferred for swallowing difficulties.	Unlikely to need: licensed alternative available
Tranexamic acid	No licensed solution	Crush tablets and mix with water. Give immediately. ²	500mg/5ml oral solution or suspension (both alcohol free) are included in Part VIII B of Drug Tariff Minimum quantity 100ml 250mg/5ml oral suspension is not as cost effective.
Tranexamic acid mouthwash		RED - refer prescribing back to specialist.	
Trazodone	LICENSED 50mg/5ml oral solution sugar free available. Avoid 100mg/5ml strength as it costs >£250 for 120ml	Opening the capsules is not recommended but there are reports of this being done. The content of the capsules tastes unpleasant. No information available about crushing the tablets, so this is not recommended. ²	Unlikely to need: licensed alternative available
Trihexyphenidyl HCL (formerly known as benzhexol)	LICENSED oral solution available (5mg/5ml)	The tablets will disperse in water for enteral tube or oral use. ² Give immediately	Unlikely to need: licensed alternative available
Ursodeoxycholic Acid	LICENSED oral suspension sugar free available (250mg/5ml, Ursofalk®)	There is no information about opening the capsules, and therefore this is not recommended. ²	Unlikely to need: licensed alternative available

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
Valproic Acid	No licensed liquid. Consider switching to LICENSED Epilim (sodium valproate) liquid 200mg/5ml. NB: there are pharmacokinetic differences; discuss with specialist before switching. It is recommended that when switching from valproic acid to sodium valproate, a slightly higher (approximately 10%) dose of sodium valproate is used and to monitor for clinical effect. ²	Tablets UNSUITABLE for crushing due to increase risk of gastrointestinal disturbance. ²	No liquid in Drug Tariff
Vancomycin	LICENSED capsules available (expensive, >£100 for 28) and certain brands of injection are licensed for oral administration. Following reconstitution, dilute required dose with 30ml water. ***Important Treatment for C. difficile should be started within 24 hours. See Nottinghamshire joint formulary for stock holding pharmacies***		Unlikely to need: licensed alternative available
Venlafaxine	LICENSED oral solution available (37.5mg/5ml and 75mg/5ml, sugar free) but it is expensive (>£150 (37.5mg/5ml) and >£200 (75mg/5ml) for 150ml). Consider switching to mirtazapine (available as orodispersible tablets) if appropriate	For non MR tablets: crush and mix with water orally or via enteral tube. ² Give immediately. Crushed tablets can be administered in jam for patients with swallowing difficulties. ² Some brands of modified-release capsules contain modified-release beads which can be emptied out and given in smooth food, e.g. yogurt, for patients with swallowing difficulties. The beads must be swallowed whole. Other brands contain mini tablets and these capsules must not be opened. ² The oral solution is licensed for NG and PEG tube administration - see SPC for detail. The modified-release capsules are not suitable for enteral tube administration. ²	Unlikely to need: licensed alternative available
Verapamil	LICENSED oral solution available (40mg/5ml, expires 3 months after opening) but it is expensive (>£150 for 150ml). If changing from a modified-release preparation to the liquid, divide the daily dose into three equal doses.	The standard tablets have been crushed and mixed with water. They have a bitter taste and a local anaesthetic effect in the mouth. ² Do NOT crush MR tablets or open the capsules ²	Unlikely to need: licensed alternative available
Warfarin	Consider switch to DOAC for licensed indications, edoxaban, rivaroxaban and apixaban are licensed to be crushed ⁴ . LICENSED oral suspension sugar free available (1mg/ml) - may have short expiry (28 days) Costs >£150 for 150ml ³	The tablets can be crushed and mixed with water for immediate oral administration. ² Enteral tubes. Warfarin appears to be absorbed high in the GI tract, and so there is a risk of reduced absorption if the drug is given through enteral feeding tubes terminating beyond the stomach. When such administration is necessary, monitor the patient closely for effect, and take particular care if the site of delivery is altered (i.e. if the jejunal tube is changed for a gastric one). ²	Unlikely to need: licensed alternative available
Zolpidem	Consider if still needed. No licensed liquid available.	Crush tablets and mix with water. ² Give immediately	No liquid in Drug Tariff
Zonisamide	LICENSED oral suspension (Desizon*) 100mg/5ml very expensive (£182 for 250ml). Seek specialist advice regarding alternative therapy. MHRA guidance recommends that (where possible) patients on zonisamide (when used for seizures) are maintained on a specific manufacturer's product, due to variability in product characteristics which may lead to a loss of seizure control when switching between brands / manufacturers. If a switch is needed, care and close monitoring is required, and where possible patients should be maintained from then onwards on a single manufacturer's product. ²	Oral suspension LICENSED via enteral tubes, see SPC for details. Capsules can be opened and contents sprinkled on apple sauce, chocolate pudding, or mixed with water or apple juice (off licence). ² Do not crush or chew contents of capsule. Monitor closely for alteration in clinical effect. The capsules can be opened and their contents dispersed in water or apple juice for administration via enteral feeding tubes (off licence). ² Due to the indication of this treatment, the medical team should consider the risks and benefits carefully before agreeing to administer the medication in an unlicensed manner. ²	Unlikely to need: licensed alternative available
Zopiclone	Consider if still needed. No licensed oral liquid. Consider changing to zolpidem or temazepam	Do not crush, bioavailability may be altered and has bitter taste. ² The tablets are not suitable for crushing or dissolving, and should not be used, as the powder will thicken quickly and may block enteral feeding tubes. ²	3.75mg/5ml oral solution Minimum quantity 150ml ³ and 7.5mg/5ml oral solution Minimum quantity 100ml ³ included in Part VIII B of Drug Tariff Note that other formulations of the same strengths also in tariff, but most cost effective options listed above.

Drug	First Choice: Use a licensed medicine in a suitable formulation (incl change to different drug in same therapeutic class)	Second Choice: Use a licensed medicine in an unlicensed manner ¹	LAST RESORT: Use an unlicensed special (this is usually an expensive option, avoid where possible)
KEY			
¹ Manipulation of a licensed product in this way will be outside of the product's marketing authorisation. However, there is evidence and clinical experience detailed in reputable sources (e.g. NEWT) confirming that formulation manipulation of this nature can take place without compromising the effectiveness of the medicine. Dispersing or crushing tablets or opening capsules should never be used to administer a fraction of a dose. Manipulation of solid dosage forms in this way for covert administration may be done in exceptional circumstances following agreement by the multidisciplinary team and taking mental capacity into consideration. It should be authorised in writing by the GP. Some formulations should not usually be crushed and this has been taken into account in the advice outlined above. Decisions should be made on an individual basis and the specific needs and best interests of the individual patient taken into account			
² The NEWT Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties. [Accessed online, Aug22]			
³ Drug Tariff Aug22- All unlicensed medicines are listed with a minimum quantity and corresponding price, which is payable for any amount prescribed up to the minimum quantity. Unless in a special container, subsequent quantities will be payable at the additional price per ml/g/tab/cap up to the total quantity prescribed. It is usually cheaper to order the total volume in one container rather than in smaller containers e.g. 200ml rather than 2 x 100ml.			
⁴ SPC. Summary of Product Characteristics. https://www.medicines.org.uk/emc/			
⁵ Notts APC antimicrobial guidelines https://www.nottsapc.nhs.uk/guidelinesformularies/antimicrobial-guidelines/			
⁶ Royal College of Paediatrics and Child Health. Using standardised concentration of unlicensed liquid medicines in children - joint position statement. [Accessed online Aug22].			
⁷ Nottinghamshire formulary. https://www.nottinghamshireformulary.nhs.uk/default.asp			