

Q&A 294.3

What are the therapeutic options for patients unable to take solid oral dosage forms?

Prepared by UK Medicines Information (UKMi) pharmacists for NHS healthcare professionals
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Summary

- ◆ Some patients are unable to take medicines in solid oral dosage forms because they have swallowing difficulties or feeding tubes. The choice of medicine for these patients should be made on an individual basis taking into account the patient's method of feeding, the practicalities of administration, product quality and cost.
- ◆ A stepped approach to choosing a suitable medicine is suggested:
 1. If possible, use a licensed medicine in a suitable formulation to meet the patient's needs (e.g. a dispersible tablet or licensed liquid medicine). Consider switching to a different agent in the same class, or to a different route of administration to allow a licensed medicine to be used.
 2. Consider using a licensed medicine in an unlicensed manner, for example by crushing/dispersing tablets or opening capsules. Not all medicines are suitable for use in this manner and it important to check beforehand. Take into account the patient/carer's ability to administer medicines in this way.
 3. In situations where the patient's needs cannot be met by licensed medicines, consider using a special-order product ('special').
- ◆ Licensed medicines should be used where possible. They are manufactured to specific standards and have been assessed for safety and efficacy.
- ◆ Special-order products are unlicensed and are not required to meet the same standards as licensed preparations. Prescribers assume greater liability when using them. They are often considerably more expensive than licensed medicines.
- ◆ An appendix to this *Medicines Q&A* lists therapeutic options for adult patients unable to take solid oral dosage forms. A second appendix provides practical advice on the administration of medicines for these patients.
- ◆ An Academic Detail Aid highlights the key points of this *Medicines Q&A* (see appendix 3).

Background

Some adults are unable to swallow solid oral dosage forms because they have swallowing difficulties or feeding tubes. Children under the age of five years (and some older children) find a liquid formulation more acceptable than tablets or capsules. However, for long-term treatment it may be possible for a child to be taught to take tablets and capsules [1].

This *Medicines Q&A* reviews the therapeutic options for patients unable to take solid oral dosage forms, and gives advice on how to choose the most appropriate preparation for a patient.

Answer

When choosing suitable preparations for a patient unable to take solid oral dosage forms, the prescriber must consider:

- Clinical appropriateness for the patient,
- Product quality and licensed status,
- Cost.

The first consideration should be to determine if a medicine is needed at all. Any unnecessary medicines should be stopped. If medication is required, consider agents with a prolonged therapeutic effect (but not modified or slow-release preparations) to reduce the frequency of dose administration.

If a medicine is required a stepped approach is suggested to choose an appropriate preparation:

1. Licensed medicines administered as intended

Licensed medicines should be used where possible. They are associated with less risk and are usually less expensive than special-order products. Licensed medicines must meet quality standards for manufacture and be accompanied by appropriate product information and labelling. In order to be granted a licence, a medicine must show evidence of efficacy and safety [2]. In many cases a licensed medicine will be suitable to meet the patient's needs, for example a licensed liquid or dispersible tablets.

- Example: Gabapentin tablets and capsules can be replaced by gabapentin oral suspension.

It may be appropriate to switch to a different medicine.

- Example: Ramipril oral solution may be a suitable alternative to perindopril tablets;
- Example: Fluoxetine liquid may be a suitable alternative to sertraline tablets.

Consider the use of dosage forms for administration via other routes such as transdermal patches or suppositories if appropriate.

- Example: Transdermal preparations of hormone replacement therapy may be preferred to oral formulations.

Adults who dislike swallowing large tablets or capsules can usually manage small tablets and capsules, or large tablets snapped in half, and, with encouragement, can manage most medicines. The use of costly special-order products for these patients is generally not justified. Community pharmacists may be able to suggest suitable preparations for their patients.

The prescriber should be aware of the route and method of administration of medicines they prescribe; information on administration of medicines via feeding tubes or with food may not be included in a product's Summary of Product Characteristics or Patient Information Leaflet.

2. Licensed medicines administered in an unlicensed manner

If there is no suitable licensed formulation, consider using a licensed medicine in an unlicensed manner, for example by crushing/dispersing tablets or opening capsules immediately prior to administration, or by administering a solution for injection via a feeding tube. Not all medicines are suitable for administration this way. Prescribers should be aware if a medicine is to be used outside its licence and take responsibility for its use in this manner.

Consider the patient's method of feeding:

- Patients requiring liquid feeds may take oral liquid medicines, dispersible tablets or solid preparations dispersed in water prior to administration. For patients who require thickened fluids, liquids can be thickened with a small amount of a thickening agent such as *Thick and Easy* maize starch and maltodextrin powder.
- Patients able to tolerate a soft-food diet may be able to swallow crushed tablets or the contents of capsules administered with food.
- Patients with enteral feeding tubes can have oral medication administered via this route.

Consider also who will be administering the medicine (the patient themselves, a parent or carer), their manual dexterity and ability to follow instructions to administer the medicine correctly.

Appendix 2 provides practical information on crushing and dispersing tablets, opening capsules and giving medicines in soft food.

Not all tablets and capsules are suitable for dispersing, crushing or opening for administration in soft food or via feeding tubes and it is important to check beforehand. Appendix 1 lists options available in several therapeutic areas and provides specific examples for adults with swallowing difficulties or feeding tubes. Further information is available from reference sources [3, 4] and medicines information centres [5].

- Example: Bendroflumethiazide tablets can be dispersed in water;
- Example: Valsartan capsules can be opened and the contents dissolved in water or mixed with food.

As before, consider switching to a different agent within the same therapeutic class in order to use a licensed product.

- Example: Amlodipine tablets can be dispersed or crushed and mixed with water. They may be a suitable alternative to other dihydropyridine calcium channel blockers, none of which is available as a licensed liquid preparation. Amlodipine is suitable for once-daily administration.

Some parenteral medicines are suitable for administration orally or via feeding tubes. A *Medicines Q&A* provides examples [6].

3. Special-order products

Medicines not commercially available in liquid formulations may be obtained as special-order liquids or extemporaneous preparations. Special-order products ('specials') and extemporaneous preparations are unlicensed and should only be considered for use when a patient's needs cannot be met by licensed medicines [7, 8]. In many cases they are not required.

Manufacturers of special-order products must hold a Manufacturer's Specials (MS) licence granted by the licensing authority and their manufacturing sites must be inspected for compliance with Good Manufacturing Practice [8, 9]. Products made under a MS licence do not have a marketing authorisation and are considered unlicensed. These products can be identified by a MS number on their label [10].

Special-order medicines may be produced as batch-prepared products or individual bespoke preparations. A certificate of analysis should be available for any batch-manufactured special-order product and is evidence that critical parameters have been confirmed by retrospective physical, chemical or microbiological assay of a sample of the final product. Bespoke special-order products should have a certificate of conformity, a signed statement by the manufacturer that they believe the product complies with the purchaser's specification [1, 10, 11].

Extemporaneous products can be made by pharmacists, or made by specials manufacturers outside of their MS licence. These products do not have a MS number on their label. There is no guarantee that the extemporaneous dispensing process meets Good Manufacturing Practice [10, 11].

Products made under licence by special-order manufacturers are preferred to extemporaneously prepared products. Batch-prepared special order products are preferred to bespoke preparations [11].

The use of special-order or extemporaneous products may increase the risk to both patient and prescriber. These products are not assessed for safety or efficacy by the regulatory authorities and prescribers assume greater liability for their use.

Special-order liquids may have a short shelf-life compared with licensed preparations and may require fridge storage.

Special-order products can be expensive, sometimes many times the cost of equivalent licensed medicines. Prescribers are often unaware of the high cost of special-order medicines they prescribe [12].

Since November 2011 a tariff for some special-order or extemporaneous products has been in place; over 100 items are listed in Part VIII B of the Drug Tariff with prices that pharmacy contractors will be reimbursed, regardless of how they are sourced. Contractors are additionally paid a fixed price (currently £20) for out of pocket expenses if they endorse the prescription SP (for special-order products) or ED (for extemporaneously prepared preparations) [10, 13].

- **Example: bendroflumethiazide**
 - Special-order bendroflumethiazide 2.5mg/5ml oral suspension is available as a batch-prepared product. It requires fridge storage. The Drug Tariff price for a 150ml bottle providing 30 doses of 2.5mg is about £75.
 - Bendroflumethiazide 2.5mg tablets can be dispersed in water. A box containing 28 doses of 2.5mg costs less than £1.
- **Example: sertraline**
 - Special-order sertraline 50mg/5ml oral suspension is available as a batch-prepared product. The Drug Tariff price for a 150ml bottle providing 30 doses of 50mg is £95.
 - Fluoxetine 20mg/5ml is available as a licensed liquid preparation. Two 70ml bottles providing 28 doses of 20mg costs £9.

Other considerations

- Consider the needs of patients and carers. It may not be practical for a patient to store or carry several bottles of liquid medicines. Some liquid medicines require fridge storage.
- NHS healthcare professionals have a duty to make the best use of public resources; cost as well as clinical suitability and product quality must be considered when choosing appropriate preparations.
- The cost of special-order products can vary enormously between different suppliers. The Royal Pharmaceutical Society has prepared guidance for community pharmacists on procurement and supply of special-order products [11].
- Whichever product is selected, review the prescription regularly to ensure continued appropriateness; the patient's needs may have changed or an alternative treatment option may be available.

An Academic Detail Aid highlighting the key points of this *Medicines Q&A* is available in Appendix 3.

Limitations

The table of options (Appendix 1) may not be comprehensive and is the opinion of the author. Where different medicines are suggested, this does not imply therapeutic equivalence.

Acknowledgements

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References

1. Paediatric Formulary Committee. BNF for Children July 2013. Accessed at www.bnfc.org on 10/7/2013.
2. Medicines and Healthcare products Regulatory Agency. Medicines & medical devices regulation: what you need to know. April 2008 Accessed at www.mhra.gov.uk/home/groups/comms-ic/documents/websiteresources/con2031677.pdf on 10/7/2013.
3. White R and Bradnam V. Handbook of drug administration via enteral feeding tubes. Print version, 2nd edition 2010. Online version updated more frequently, available via www.medicinescomplete.com (subscription required).
4. Smyth J, editor. The NEWT Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties. Print version, 2nd edition published 2012. Online version updated more frequently, available at www.newtguidelines.com (subscription required).
5. UK Medicines Information centres: contact details available at www.ukmi.nhs.uk/ukmi/directory/default.asp.
6. UKMi. Medicines Q&A 175.2. Which injections can be given enterally? June 2011. Accessed via www.evidence.nhs.uk on 10/7/2013.
7. General Medical Council. Good practice in prescribing and managing medicines and devices. January 2013. Accessed at www.gmc-uk.org/Prescribing_Guidance_2013_50955425.pdf on 10/7/2013.
8. Medicines and Healthcare products Regulatory Agency. Summary report for importation of unlicensed medicines 01 July 2011 - 30 September 2011. Approved June 2012. Appendix 1: Risk hierarchy for the use of unlicensed medicines. Accessed at www.mhra.gov.uk/home/groups/is-lic/documents/websiteresources/con160566.pdf on 10/7/2013.
9. Medicines and Healthcare products Regulatory Agency. Medicines that do not need a licence (Exemptions from licensing). Accessed at www.mhra.gov.uk/Howweregulate/Medicines/Doesmyproductneedallicence/Medicinesthatdonotneedallicence/index.htm on 10/7/2013.
10. NHS Business Services Authority. New arrangements for reimbursing specials – Q&A. November 2011. Accessed at www.nhsbsa.nhs.uk/Documents/PrescriptionServices/20111011_Specials_Tariff_Q_and_A.pdf on 10/7/2013.
11. Royal Pharmaceutical Society. Good practice guidance on the procurement and supply of pharmaceutical 'Specials'. June 2010 (partial updated June 2011). Accessed via www.rpharms.com (password required) on 10/7/2013.
12. National Prescribing Centre. Prescribing specials: Five guiding principles for prescribers. 2011. Accessed at www.npc.nhs.uk/improving_safety/prescribing_specials/resources/5_guiding_principles_V2.pdf on 10/7/2013.
13. NHS Business Services Authority. Drug Tariff. July 2013. Accessed online via www.nhsbsa.nhs.uk/PrescriptionServices/924.aspx.

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Search strategy

In-house enquiries.

Professional guidance: General Pharmaceutical Council, Royal Pharmaceutical Society, General Medical Council, British Medical Association, Nursing and Midwifery Council, Care Quality Commission.

Legislation: Medicines and Healthcare products Regulatory Agency.

Reimbursement: NHS Business Services Authority, Pharmaceutical Services Negotiating Committee.

Special-order manufacturers: personal communication.

Internet searches: search terms included special-order medicines, dysphagia, medicines administration, crushing, dispersing, unlicensed, feeding tubes, swallowing.

Appendix 1: Table of therapeutic options for adult patients unable to take solid oral dosage forms

- ◆ The following table lists therapeutic options for adult patients unable to swallow solid oral dosage forms. Information included can be used to choose medicines for patients with swallowing difficulties or feeding tubes.
- ◆ The choice of medicine should be made on an individual basis taking into account the patient's method of feeding, the practicalities of administration, product quality and cost.
- ◆ The *Medicines Q&A* which this appendix accompanies reviews therapeutic options for patients unable to take solid oral dosage forms, and gives advice on how to choose the most appropriate preparation [1].

A stepped approach is suggested:

1. If possible, use a licensed medicine in a suitable formulation to meet the patient's needs (e.g. a dispersible tablet or licensed liquid medicine). Consider switching to a different agent in the same class, or to a different route of administration to allow a licensed medicine to be used.
 2. Consider using a licensed medicine in an unlicensed manner, for example by crushing/dispersing tablets or opening capsules. Not all medicines are suitable for use in this manner and it is important to check beforehand. Take into account the patient/carer's ability to administer medicines in this way.
 3. In situations where the patient's needs cannot be met by licensed medicines, consider using a special-order product ('special').
- ◆ The inclusion of a special-order medicine in the table does not endorse its use. It is noted if a special-order medicine is available as a batch-prepared product or only as a bespoke preparation, and if it has a short shelf-life (less than one month) or requires fridge storage. Batch-prepared products supplied with a certificate of conformity are preferred to bespoke preparations.
 - ◆ The therapeutic drug classes chosen for inclusion in the table have been highlighted as having particular relevance to primary care, and include those where there has been a high spend on special-order medicines.
 - ◆ Where alternative agents are suggested, therapeutic equivalence is not implied. Patients will require monitoring and possibly dose titration when switching between different agents.
 - ◆ The prescriber should be aware of the licensed status, route and method of administration of medicines they prescribe. Prescribers assume greater liability for use of unlicensed medicines and for use of licensed medicines in an unlicensed manner, than for licensed medicines used as intended.
 - ◆ Indicative prices are included in the table*. Prices for licensed medicines are for generic preparations where available and reflect NHS costs in primary care. For special-order preparations listed in Part VIII B of the Drug Tariff, the Tariff price is listed. This is the price pharmacy contractors are reimbursed (plus an additional fee), regardless of how these products are sourced. The cost of special-order products outside of the Drug Tariff is unregulated and can vary enormously between suppliers.

* Where possible, prices for licensed medicines are taken from July 2013 Drug Tariff Part VIII A-Basic prices of drugs; Prices for special-order preparations are taken from July 2013 Drug Tariff Part VIII B.

1. Medicines Q&A 294.3. What are the therapeutic options for patients unable to take solid oral dosage forms? July 2013. Available via www.evidence.nhs.uk.

Table of therapeutic options for adult patients unable to take solid oral dosage forms

BNF 1.3.5 Proton pump inhibitors

Licensed medicines in suitable formulations

Lansoprazole orodispersible tablets (*Zoton FasTabs*) can be allowed to disperse in the mouth then swallowed, or mixed with water to give a dispersion of small (0.33mm) granules for administration orally or via a feeding tube. The granules must not be crushed or chewed [28 x 15mg: £3].

Esomeprazole tablets and gastro-resistant granules for oral suspension can be mixed with water to give a dispersion of small granules for administration orally or via a feeding tube. The granules must not be crushed or chewed. Lower strength (20mg) tablets may be less likely to cause blockage than 40mg tablets; for patients with fine bore tubes, lansoprazole orodispersible tablets (*Zoton FasTabs*) may be preferred as the granules are smaller [28 x 20mg or 40mg tablets: £6-8; 28 x 10mg sachets: £25].

Esomeprazole gastro-resistant capsules can be opened and the contents mixed with water to give a dispersion of small granules for administration orally or via a feeding tube [28 x 20mg or 40mg capsules: £10-13].

Omeprazole dispersible tablets (*Losec MUPS*) can be mixed with water to give a dispersion of small (0.5mm) granules that can be given orally. The granules can also be mixed with fruit juice, apple sauce or yoghurt for oral administration; care must be taken not to crush or chew the granules [28 x 10mg: £8; 28 x 20mg: £12].

H₂-receptor antagonists are available for patients in whom step-down therapy is appropriate: Ranitidine effervescent tablets [60 x 150mg: £14] and ranitidine 75mg/5ml oral solution [300ml: £8] are suitable for administration orally or via a feeding tube.

Licensed medicines used in an unlicensed manner

Omeprazole dispersible tablets (*Losec MUPS*) can be mixed with water to give a dispersion of small (0.5mm) granules. The granules have a tendency to block fine bore feeding tubes but can be mixed with water or 8.4% sodium bicarbonate for administration via wider feeding tubes.

Special-order medicines

In view of the licensed products available, special-order preparations may not be required.

Omeprazole 10mg/5ml [Drug Tariff price for 75ml: £135] and 20mg/5ml [150ml: £150] oral suspensions are available as batch-prepared products; 5mg/5ml [70ml: £135] oral suspension is only available as a bespoke special-order preparation; all require fridge storage.

Lansoprazole oral suspensions are available as bespoke special-order preparations; they require fridge storage [Drug tariff prices for 100ml: 15mg/5ml: £220, 30mg/5ml: £195].

BNF 2.2 Thiazide diuretics

Licensed medicines in suitable formulations

There are no suitable licensed formulations of bendroflumethiazide or other thiazide diuretics.

Loop diuretics are available as liquid preparations. They can be given via feeding tubes but may require dilution with water:

- Furosemide 20mg/5ml, 40mg/5ml and 50mg/5ml oral solutions [150ml: £14-20 depending on strength].
- Bumetanide 1mg/5ml oral liquid [150ml: £130].

Licensed medicines used in an unlicensed manner

Bendroflumethiazide tablets can be dispersed in water and given orally or via a feeding tube [28 x 2.5mg: <£1].

Indapamide immediate-release tablets can be dispersed in water for administration orally or via some feeding tubes, but absorption may be reduced if administered via tubes ending in the jejunum. Some indapamide immediate-release tablets are film-coated; they can be crushed and mixed with water before administration [28 x 2.5mg: £4].

Special-order medicines

Bendroflumethiazide 2.5mg/5ml oral suspension is available as a batch-prepared product; it requires fridge storage [Drug Tariff price for 150ml: £75].

BNF 2.5.5 Renin-angiotensin medicines

ACE inhibitors

Licensed medicines in suitable formulations

Ramipril 2.5mg/5ml oral solution is available as a licensed product; it requires fridge storage [150ml: £80].

Licensed medicines used in an unlicensed manner

- Enalapril tablets can be crushed or dispersed in water for administration orally or via a feeding tube; the crushed tablets may have a bitter aftertaste [28 tablets, any strength: <£2].
- Lisinopril tablets can be dispersed in water for administration orally or via a feeding tube [28 tablets, any strength: <£2].
- Perindopril erbumine tablets can be crushed or dispersed in water for administration orally or via a feeding tube [30 tablets, any strength: (perindopril erbumine) <£2].
- Ramipril *tablets* can be dispersed in water for administration orally or via a feeding tube [28 tablets, any strength: <£2].
- Ramipril *capsules* can be opened and the contents mixed with water for administration orally or via a feeding tube. The capsule contents taste unpleasant but can be mixed with food [28 capsules, any strength: <£2].

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Special-order medicines

NB: Ramipril 2.5mg/5ml oral solution is available as a licensed product.

The following batch-prepared products are included in the Drug Tariff:

- Enalapril 5mg/5ml oral solution; it requires fridge storage [150ml: £100].
- Lisinopril 5mg/5ml oral solution [150ml: £60].
- Captopril 5mg/5ml [100ml: £100] and 25mg/5ml oral solutions [100ml: £110]; they require fridge storage.

The following bespoke special-order preparations are included in the Drug Tariff:

- Enalapril 5mg/5ml oral suspension [75ml: £165].
- Lisinopril 5mg/5ml oral suspension [100ml: £145].
- Captopril 5mg/5ml [100ml: £150] and 25mg/5ml [100ml: £160] oral suspensions; they require fridge storage and may have a short shelf-life.

NB: Captopril is not suitable for once-daily administration.

The following batch-prepared products are available but not included in the Drug Tariff:

- Perindopril 4mg/5ml and 8mg/5ml oral solutions; they require fridge storage.
- Ramipril 1.25mg/ml, 5mg/5ml and 10mg/5ml oral solutions; they require fridge storage.

Angiotensin II receptor antagonists

Licensed medicines in suitable formulations

Losartan 12.5mg/5ml oral suspension (supplied as powder and solvent) is available as a licensed preparation. Once reconstituted, it has a four-week shelf-life and requires fridge storage [200ml: £55].

NB: ACE inhibitors are preferred for most patients; angiotensin II receptor antagonists are reserved for patients unable to tolerate ACE inhibitors.

Licensed medicines used in an unlicensed manner

The following options are suitable for administration orally or via feeding tubes. Irbesartan tablets disperse more readily than other preparations and are preferred for administration via feeding tubes.

- Candesartan tablets can be crushed and mixed with water [28 tablets, 2mg, £14; 4mg-32mg: £2-4 depending on strength].
- Irbesartan tablets can be dispersed in water [28 tablets: £2-3 depending on strength].
- Losartan tablets can be crushed and mixed with water [28 tablets: £2-5 depending on strength].
- Valsartan capsules can be opened and the contents mixed with water [28 capsules: £2-3 depending on strength].

Special-order medicines

NB: Losartan 12.5mg/5ml oral suspension is available as a licensed product.

There are no suitable special-order medicines listed in the Drug Tariff.

The following batch-prepared products are available but not included in the Drug Tariff:

- Candesartan 8mg/5ml oral suspension.
- Losartan 50mg/5ml oral suspension.

BNF 2.6.2 Calcium channel antagonists

Amlodipine

Licensed medicines in suitable formulations

There are no suitable licensed formulations of amlodipine or other dihydropyridine calcium channel blockers.

Licensed medicines used in an unlicensed manner

Amlodipine tablets (besilate or maleate salts) can be dispersed or crushed and mixed with water for administration orally or via a feeding tube [28 x 5mg or 10mg: £1].

Special-order medicines

Amlodipine oral *solutions* 5mg/5ml [Drug Tariff price for 150ml: £80] and 10mg/5ml [150ml: £135] are available as batch-prepared products; they require fridge storage.

Amlodipine oral *suspensions* 5mg/5ml [Drug Tariff price for 100ml: £145] and 10mg/5ml [70ml: £140] are available as bespoke special-order preparations.

BNF 2.8.2 Oral anticoagulants

Licensed medicines in suitable formulations

Warfarin 1mg/1ml oral suspension is available as a licensed preparation [150ml: £100].

Licensed medicines used in an unlicensed manner

Warfarin tablets can be crushed and mixed with water for administration orally or via a feeding tube [28 tablets any strength <£2].

Rivaroxaban tablets can be crushed and mixed with water for administration orally or via a nasogastric or percutaneous endoscopic gastrostomy tube; they are not suitable for administration via feeding tubes that terminate in the duodenum or jejunum owing to decreased absorption of the drug [28 or 30 tablets £60-65, depending on strength].

Dabigatran capsules must not be opened; bioavailability of the capsule contents may be increased by 75% when taken without the shell.

Special-order medicines

In view of the licensed warfarin 1mg/1ml oral suspension available, special-order preparations are unlikely to be required.

Warfarin 1mg/5ml oral suspension is available as a batch-prepared product. It is not included in the Drug Tariff.

BNF 2.9 Antiplatelet medicines

Licensed medicines in suitable formulations

There are no suitable licensed formulations of clopidogrel or modified-release dipyridamole.

Dispersible aspirin tablets should be considered for patients requiring antiplatelet monotherapy. They are suitable for administration orally or via a feeding tube [28 x 75mg <£1].

Dipyridamole 50mg/5ml oral suspension is available [150ml: £40] and can be given orally or via a feeding tube. It is only licensed for use in patients with prosthetic heart valves in combination with oral anticoagulation. *NB: Evidence only supports use of modified-release, not immediate-release, dipyridamole preparations for prevention of vascular events.*

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Licensed medicines used in an unlicensed manner

Clopidogrel tablets are film-coated but can be dispersed or crushed and mixed with water for administration orally or via a feeding tube [28 x 75mg: £2].

Dipyridamole *modified-release capsules (Persantin Retard)* may be opened and the modified-release granules mixed with water. There is a risk that the granules can block feeding tubes. The granules must not be crushed. The granules may be given with soft food; care must be taken not to crush or chew the granules as this will damage the modified-release coating making this option unsuitable for patients with limited understanding or unable to follow instructions [60 x 200mg: £10].

Dipyridamole *immediate-release tablets (Persantin)* can be crushed and mixed with water for administration orally or via a feeding tube [84 x 100mg: £4]. *NB: Evidence only supports use of modified-release, not immediate-release, dipyridamole preparations for prevention of vascular events.*

Special-order medicines

Dipyridamole 100mg/5ml oral suspension is available as a batch-prepared product [Drug Tariff price for 150ml: £110]. *NB: Dipyridamole 50mg/5ml suspension is available as a licensed product.*

Clopidogrel 75mg/5ml oral *solution* is available as a batch-prepared product [Drug Tariff price for 150ml: £80].

Clopidogrel 75mg/5ml oral *suspension* is available as a bespoke special-order preparation. It may have a short shelf-life [Drug Tariff price for 100ml: £225].

BNF 2.12 HMG CoA reductase inhibitors 'statins'

Licensed medicines in suitable formulations

Simvastatin 20mg/5ml [150ml: £110] and 40mg/5ml [150ml: £170] oral suspensions are available as licensed products; they are suitable for administration orally or via a feeding tube.

Licensed medicines used in an unlicensed manner

Simvastatin tablets are film-coated but can be crushed and mixed with water for administration orally or via a feeding tube [28 tablets, any strength: <£2].

Pravastatin tablets can be crushed and dispersed in water for administration orally or via a feeding tube; they disperse more readily than simvastatin tablets [28 tablets, any strength <£2].

Atorvastatin tablets are film-coated but can be crushed and dispersed in water for administration orally or via a feeding tube; they disperse more readily than simvastatin tablets [28 tablets <£4 depending on strength].

Fluvastatin immediate-release capsules can be opened and the contents mixed with water for administration orally or via a feeding tube. The 20mg capsules are small and may be fiddly to open [28 x 20mg or 40mg capsules: <£3].

Rosuvastatin tablets can be crushed and mixed with water for administration orally or via a feeding tube [28 tablets: £18-30 depending on strength].

Special-order medicines

In view of the licensed simvastatin oral suspensions available, special-order preparations are unlikely to be required.

Atorvastatin 20mg/5ml oral suspension is available as a bespoke special-order preparation. It has an eight-day shelf-life and requires fridge storage [Drug Tariff price for 100ml: £165].

BNF 4.1 Hypnotics

Chloral hydrate

Licensed medicines in suitable formulations

Chloral hydrate 143.3mg/5ml elixir (*Welldorm* elixir) is suitable for administration orally or via a feeding tube [150ml: £9].

Other hypnotics may be preferred:

- Nitrazepam 2.5mg/5ml oral suspension is suitable for administration orally or via a feeding tube; for administration via feeding tubes that end in the jejunum, consider diluting the suspension with water to reduce osmolarity [150ml: £5].
- Temazepam 10mg/5ml oral solution is suitable for administration orally or via a feeding tube [300ml: £55].

Licensed medicines used in an unlicensed manner

Zolpidem tablets can be dispersed or crushed and mixed with water for administration orally or via a feeding tube [28 x 5mg or 10mg tablets: <£2].

Special-order medicines

NB: Chloral hydrate elixir is available as a licensed preparation (Welldorm elixir) and should be used in preference to a special-order product. Welldorm preparations are listed in the BNF under 'cloral betaine' but only the tablets contain the betaine salt.

Chloral hydrate 500mg/5ml mixture BP 2000 is available as a batch-prepared product [Drug Tariff price for 200ml: £25].

Chloral hydrate paediatric mixture (200mg/5ml, 'chloral elixir, paediatric, BP 2000') can be obtained as a bespoke special-order preparation. It is not included in the Drug Tariff.

Zopiclone

Licensed medicines in suitable formulations

There are no suitable licensed formulations of zopiclone.

Other hypnotics may be preferred:

- Nitrazepam 2.5mg/5ml oral suspension is suitable for administration orally or via a feeding tube; for administration via feeding tubes that end in the jejunum, consider diluting the suspension with water to reduce the osmolarity [150ml: £5].
- Temazepam 10mg/5ml oral solution is suitable for administration orally or via a feeding tube [300ml: £55].

Licensed medicines used in an unlicensed manner

Zopiclone tablets are not suitable for crushing or dispersing for administration via a feeding tube.

A suitable alternative may be zolpidem tablets, which can be dispersed or crushed and mixed with water for administration orally or via a feeding tube [28 x 5mg or 10mg tablets: <£2].

Special-order medicines

Zopiclone 3.75mg/5ml and 7.5mg/5ml oral *solutions* are available as batch-prepared products; they require fridge storage [Drug Tariff price for 3.75mg/5ml x150ml: £50]. NB: The 7.5mg/5ml strength preparation is not included in Drug Tariff.

Zopiclone 3.75mg/5ml oral *suspension* is available as a bespoke special-order preparation; it requires fridge storage [Drug Tariff price for 100ml: £130].

BNF 4.2 Atypical antipsychotics

Quetiapine

NB: There is a clear increased risk of stroke and a small increased risk of death when antipsychotic medicines (typical or atypical) are used in elderly patients with dementia.

Licensed medicines in suitable formulations

There are no suitable licensed formulations of quetiapine.

Other atypical antipsychotics are available and may be suitable for some patients:

- Amisulpride oral solution can be administered orally or via a feeding tube [100mg/ml x 60ml: £35].
- Aripiprazole orodispersible tablets can be dispersed in water for administration orally [28 x 10mg or 15mg tablets: £95].
- Aripiprazole oral solution is available [1mg/ml x 150ml: £100].
- Olanzapine orodispersible tablets can be dispersed in water for administration orally or via a feeding tube [28 x generic tablets: £3-6, depending on strength; 28 x generic tablets, sugar-free: £15-50, depending on strength; 28 x *Zyprexa Velotab*: £50-175, depending on strength].
- Risperidone *liquid* can be administered orally or via a feeding tube [1mg/ml x 100ml: £55].
- Risperidone *orodispersible tablets* can be dispersed in water for administration orally or via a feeding tube [28 x tablets: £20-35 depending on strength].

Depot medication may be considered in some circumstances.

'Typical' antipsychotics may be suitable for some patients. The following licensed products are available and can be administered orally or via a feeding tube:

- Chlorpromazine 25mg/5ml and 100mg/5ml oral solutions [150ml: £2-6].
- Haloperidol 5mg/5ml and 10mg/5ml oral solutions [100ml: £6-7].
- Sulpiride 200mg/5ml oral solution [150ml: £25].
- Trifluoperazine 1mg/5ml [200ml: £30] and 5mg/5ml [150ml: £25] oral solutions (for administration via feeding tubes that end in the jejunum, consider diluting the suspension with an equal volume of water to reduce osmolarity).

Licensed medicines used in an unlicensed manner

Quetiapine immediate-release tablets can be crushed and mixed with water for administration via feeding tubes. The crushed tablets may be administered in soft food but taste bitter [60 tablets: £3-7 depending on strength].

Special-order medicines

The following batch-prepared products are included in the Drug Tariff:

- Quetiapine 12.5mg/5ml [100ml: £110], 25mg/5ml [150ml: £130] and 100mg/5ml [100ml: £120] oral suspensions; they require fridge storage.
- Amisulpride 25mg/5ml oral *solution* [100ml: £100].
- Haloperidol 1mg/5ml oral *solution* [200ml: £65].

NB: Haloperidol 5mg/5ml and 10mg/5ml oral solutions are available as licensed products.

Continued...

The following bespoke special-order preparations are listed in the Drug Tariff:

- Amitriptyline 25mg/5ml oral *suspension*; it requires fridge storage [150ml: £165].
- Haloperidol 1mg/5ml oral *suspension* [100ml: £120].

NB: Haloperidol 5mg/5ml and 10mg/5ml oral solutions are available as licensed products.

BNF 4.3.1 Tricyclic and related anti-depressants

Dosulepin

NB: NICE guidance on depression states that dosulepin should not be prescribed. It is associated with an increased risk of cardiac toxicity and toxicity in overdose.

Licensed medicines in suitable formulations

There are no suitable licensed formulations of dosulepin.

Other tricyclic antidepressants are available and may be preferred:

- Amitriptyline 25mg/5ml [150ml: £15] and 50mg/5ml [150ml: £20] oral solutions can be administered orally or via a feeding tube.
- Lofepamine 70mg/5ml oral suspension can be administered orally or via a feeding tube [150ml: £20].

Licensed medicines used in an unlicensed manner

Dosulepin *capsules* can be opened and the contents mixed with water for administration orally or via a feeding tube; the capsule contents can be sprinkled on food but may have a local anaesthetic action [28 x 25mg <£2].

Dosulepin *tablets* can be crushed but do not disperse in water easily; they are generally not considered suitable for administration via a feeding tube although some generic tablets have been administered after crushing once the tablet coating has dissolved [28 x 75mg <£2].

Special-order medicines

Amitriptyline 10mg/5ml oral *solution* is available as a batch-prepared product [Drug Tariff price for 150ml: £15].

Amitriptyline 10mg/5ml oral *suspension* is available as a bespoke special-order preparation [Drug Tariff price for 100ml: £110].

NB: Amitriptyline 25mg/5ml and 50mg/5ml oral solutions are available as licensed products.

Dosulepin 25mg/5ml oral solution is available as a batch-prepared product [Drug Tariff price for 500ml: £140].

Dosulepin 75mg/5ml oral solution is available as a batch-prepared product. It is not included in the Drug Tariff.

BNF 4.3.3 Selective Serotonin Re-uptake Inhibitors (SSRIs)

Sertraline

Licensed medicines in suitable formulations

There are no suitable licensed formulations of sertraline.

Other SSRIs are available and may be preferred:

- Fluoxetine 20mg/5ml oral liquid can be administered orally or via feeding tube. For administration via a feeding tube it should first be mixed with an equal volume of water [70ml: £4].
- Citalopram 40mg/ml oral drops should be mixed with water, orange juice or apple juice and given orally or via a feeding tube. Citalopram drops are not bioequivalent to citalopram tablets; four drops (8mg) is equivalent in effect to one 10mg tablet [15ml: £10].
- Escitalopram 20mg/ml oral drops can be administered orally or via a feeding tube. The drops can be mixed with water, apple juice or orange juice before administration [15ml: £20].
- Paroxetine 10mg/5ml oral suspension can be administered orally or via a feeding tube. For administration via a feeding tube it should first be mixed with an equal volume of water [150ml: £10].

Licensed medicines used in an unlicensed manner

Sertraline tablets can be dispersed or crushed and mixed with water for administration orally or via a feeding tube. Crushed tablets can be mixed with food but have a bitter taste and may have a local anaesthetic effect [28 x 50mg or 100mg: £7-8].

Special-order medicines

In view of the licensed products available, special-order preparations may not be required.

Sertraline 50mg/5ml oral suspension is available as a batch-prepared product [Drug Tariff price for 150ml: £95].

BNF 4.8 Antiepileptic medicines

Clobazam

Licensed medicines in suitable formulations

Clobazam 5mg/5ml [100ml: £115] and 10mg/5ml [100ml: £120] oral suspensions are available as licensed products.

NB: Clobazam is difficult to suspend and there has been a case report of fitting following the switching of a patient from the tablet formulation to an extemporaneous liquid product. Ensure the full dose is taken

Licensed medicines used in an unlicensed manner

Clobazam tablets can be dispersed or crushed and mixed with water for administration orally or via a feeding tube but taste unpleasant [30 x 10mg <£5].

Special-order medicines

In view of the licensed products available, special-order preparations are unlikely to be required.

Clonazepam

Licensed medicines in suitable formulations

Clonazepam 500mcg/5ml [150ml: £70] and 2mg/5ml [150ml: £90] oral solutions are available as licensed products.

Licensed medicines used in an unlicensed manner

Clonazepam tablets can be dispersed in water for administration orally or via a feeding tube; for administration via a feeding tube dilute with at least 30ml water to prevent binding to the tube [100 x 500mcg or 2mg: <£5].

Clonazepam injection can be administered orally or via a feeding tube; for administration via a feeding tube dilute with 1ml water [5 x 1ml ampoule (1mg): £3].

Special-order medicines

In view of the licensed product available, special-order preparations are unlikely to be required.

Gabapentin

Licensed medicines in suitable formulations

Gabapentin 250mg/5ml oral solution is available as a licensed product. It contains propylene glycol, acesulfame K and saccharin sodium; large doses in patients with low body weight may exceed WHO daily limits for these excipients [150ml: £60].

Licensed medicines used in an unlicensed manner

Gabapentin *capsules* can be opened and the contents mixed with water for administration orally or via a feeding tube. The capsule contents can be mixed with soft food or fruit juice; strong flavours may mask the unpleasant taste. Capsule contents should be taken immediately as the drug is rapidly hydrolysed. The 100mg capsules are small and may be fiddly to open [100 x 100mg-800mg capsules: £3-35 depending on strength].

Special-order medicines

In view of the licensed product available, special-order preparations are unlikely to be required.

Pregabalin

Licensed medicines in suitable formulations

Pregabalin 100mg/5ml oral solution is available as a licensed product [473ml: £100].

Licensed medicines used in an unlicensed manner

Pregabalin capsules can be opened and the contents dissolved in water for administration orally or via a feeding tube [56 capsules: £65; 84 capsules £95, all strengths].

Special-order medicines

In view of the licensed product available, special-order preparations are unlikely to be required.

Pregabalin 75mg/5ml oral suspension is available as a bespoke special-order preparation. It has a two-week shelf-life [Drug Tariff price for 100ml: £205].

Phenobarbital

Licensed medicines in suitable formulations

Phenobarbital elixir 15mg/5ml is available but contains 38% alcohol. It is not considered suitable for use in children. It may be given orally or via a feeding tube for adults [500ml: £5].

Licensed medicines used in an unlicensed manner

Phenobarbital tablets may be crushed and mixed with water for administration orally or via a feeding tube [28 tablets, 15mg: £15, 30mg: £1, 60mg: £5].

Special-order medicines

Phenobarbital 50mg/5ml oral *solution* is available as a batch-prepared product [Drug Tariff price for 150ml: £130].

Phenobarbital 50mg/5ml oral *suspension* is available as a bespoke special-order preparation [Drug Tariff price for 100ml: £135].

6.1 Drugs used in diabetes

Metformin

Licensed medicines in suitable formulations

Metformin powder for oral solution is available in 500mg and 1g sachets. The sachet contents should be mixed with 150ml water immediately before administration orally or via a feeding tube; smaller volumes have been used [60 sachets: £7-13 depending on strength].

Metformin 500mg/5ml oral solution is available and can be given orally or via a feeding tube [150ml: £60].

Licensed medicines used in an unlicensed manner

Metformin *immediate-release* tablets can be crushed and mixed with water for administration orally or via a feeding tube, but some tablets are difficult to crush [28 x 500mg: £1; 56 x 850mg: £2].

Modified-release metformin tablets must not be crushed.

Special-order medicines

In view of the licensed products available, special-order preparations are unlikely to be required.

6.3 Glucocorticoid therapy

Hydrocortisone

Licensed medicines in suitable formulations

There are no suitable licensed formulations of hydrocortisone.

Licensed medicines used in an unlicensed manner

Hydrocortisone tablets can be dispersed in water for administration orally or via a feeding tube [30 x 10mg or 20mg: £50].

Efcortisol (hydrocortisone sodium phosphate 100mg/ml) injection can be administered orally or enterally, but the phosphate content should be considered [5 x 1ml ampoules (100mg): £5; 5 x 5ml ampoules (500mg): £25].

Special-order medicines

Hydrocortisone 5mg/5ml and 10mg/5ml oral suspensions are available as batch-prepared products [Drug Tariff price for 100ml: £200 (for 5mg/5ml), £230 (for 10mg/5ml)].

Bibliography

- Boehringer Ingelheim Ltd. Summary of Product Characteristics, Pradaxa (dabigatran) 110mg hard capsules. Accessed via www.emc.medicines.org.uk on 10/7/2013.
- Chemist+Druggist. Monthly price list Volume 54, no 7, July 2013.
- Joint Formulary Committee. British National Formulary July 2013. Accessed via www.medicinescomplete.com.
- National Institute for Health and Clinical Excellence. Clinical Guideline 90: Depression. October 2009. Accessed at www.nice.org.uk/nicemedia/pdf/CG90NICEguideline.pdf.
- NHS Business Services Authority. Drug Tariff. July 2013. Accessed online via www.nhsbsa.nhs.uk/PrescriptionServices/924.aspx.
- Nova Laboratories Ltd. Personal communication, 1/8/2013.
- Nova Laboratories Ltd. Price list June 2013. Downloaded from www.novalabs.co.uk on 15/7/2013.
- Paediatric Formulary Committee. BNF for Children. July 2013. Accessed at www.bnfc.org on 10/7/2013.
- Rosemont Pharmaceutical Ltd. Personal communication, 31/7/2013.
- Rosemont Pharmaceuticals Ltd. Retail licensed and specials price list. Downloaded from www.rosemontpharma.com on 30/7/2013.
- Smyth J, editor. The NEWT Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties. Accessed at www.newtguidelines.com.
- The Specials Laboratory Limited. Personal communication, 31/7/2013.
- UKMi. Medicines Q&A 175.2. Which injections can be given enterally? June 2011. Accessed via www.evidence.nhs.uk on 10/7/2013.
- White R and Bradnam V. Handbook of drug administration via enteral feeding tubes. Accessed via www.medicinescomplete.com.

Appendix 2: Administering medicines to patients unable to take solid oral dosage forms

In all cases, first establish that a medicine is suitable for administration in the intended manner. Consult standard reference texts or contact your medicines management team or medicines information centre for advice [1, 2, 3].

Care staff may only administer medicines in an unlicensed manner on the instruction of the prescriber. A written direction to crush or disperse tablets or to open capsules should be documented in the patient's care plan.

• **Crushing or dispersing tablets**

Many immediate-release tablets will disperse sufficiently in water to be suitable for administration via an enteral feeding tube without the need for crushing [1]. Modified-release tablets are not suitable for crushing or dispersing.

For medicines that are suitable for crushing, crush using a tablet crusher, a pestle and mortar or between two metal spoons. Only crush medicines one at a time; do not crush all the patient's medicines together. Crushing or dispersing should only be performed immediately before administration.

• **Opening capsules**

Some hard gelatin capsules can be opened and their contents mixed with water or administered with food. Some capsules may be too small to manipulate. Capsules should only be opened immediately before administration.

• **Administering medicines in liquids or soft food**

Crushed medicines or capsule contents may be given with a small amount of cold liquid or soft food such as a teaspoon of yoghurt or jam. A small amount should be used to ensure the full dose is taken; if taken with a meal, the medicine should be added to the first mouthful of food.

Crushed tablets or capsule contents may taste very bitter; it can be helpful to mask the taste for patients taking these medicines orally by using strong flavours such as jam or blackcurrant cordial. Medicines should not be mixed or administered in a baby's feeding bottle [4].

Medicines should only be administered in food with the patient's knowledge and consent. Hiding medication in food is considered 'covert administration' and is only condoned in certain circumstances [5].

• **Administering medicines via feeding tubes**

Feeding tubes should be flushed with water before and after each medicine is administered. If the medicine is viscous, flushing or dilution with water may be required during administration. For patients who are fluid-restricted, the volume of water used for flushing needs to be considered. Medicines should not be added to enteral feeds.

When administering crushed tablets or opened capsules via a feeding tube, mix the powder with 15-30ml water. Draw into a 50ml oral syringe and administer. If you have used a mortar or tablet crusher, rinse this with water and administer the rinsings also.

Suggested protocol for administering medicines via a feeding tube [2]:

1. Stop the feed (leaving a feeding break if necessary).
2. Flush the tube with 30ml water.
3. Prepare the first medicine for administration, and administer it.
4. Flush with 10ml water.
5. Repeat stages 3 and 4 with subsequent medicines.
6. Flush with at least 30ml water.
7. Re-start the feed (leaving a feeding break if necessary).

The administration of medicines via feeding tubes by care workers in care homes and those providing domiciliary care should only be performed by those with the competency and skills required [6]. Procedures should be in place to ensure care workers who agree to give medicines via feeding tubes receive appropriate training.

References

1. White R and Bradnam V. Handbook of drug administration via enteral feeding tubes. Accessed via www.medicinescomplete.com.
2. Smyth J, editor. The NEWT Guidelines for administration of medication to patients with enteral feeding tubes or swallowing difficulties. Accessed via www.newtguidelines.com on 10/7/2013.
3. UK Medicines Information centres: contact details available at www.ukmi.nhs.uk/ukmi/directory/default.asp.
4. Paediatric Formulary Committee. BNF for Children. July 2013. Accessed at www.bnfc.org on 10/7/2013.
5. Nursing and Midwifery Council. Covert administration of medicines – disguising medicine in food and drink. November 2007. Accessed at www.nmc-uk.org/Nurses-and-midwives/Regulation-in-practice/Medicines-management-and-prescribing/Covert-administration-of-medicines/ on 10/7/2013.
6. Care Quality Commission. Guidance about compliance: Essentials standards of quality and safety. March 2010. Accessed at www.cqc.org.uk/sites/default/files/media/documents/gac_-_dec_2011_update.pdf on 10/7/2013.

**Appendix 3:
Corby CCG and Nene CCG algorithm for patients with swallowing difficulties**

