

Therapeutic options for adult patients unable to take solid oral dosage forms

(Adapted from UKMi Q&A 294.3 for use in Northern Ireland) Sep 2015

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].

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].

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 [28 x 20mg or 40mg tablets: £4-6; 28 x 10mg sachets: £25]. For patients with fine bore tubes, lansoprazole orodispersible tablets (*Zoton FasTabs*) may be preferred as the granules are smaller.

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: £4].

H₂-receptor antagonists are available for patients in whom step-down therapy is appropriate: Ranitidine effervescent tablets [60 x 150mg: £34] 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.

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: £14-19 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: £2].

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: £96].

Captopril 25mg/5ml oral solution is available as a licensed product [100ml: £109].

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].

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: £2-15 depending on strength].

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].

BNF 2.8.2 Oral anticoagulants

Licensed medicines in suitable formulations

Warfarin 1mg/1ml oral suspension is available as a licensed preparation [150ml: £108].

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 £59-63, depending on strength].

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

Apixaban tablets can be crushed and dispersed in glucose 5% for administration. Take care to ensure the whole dose is administered, and for patients with enteral feeding tubes, flush well after each dose [56-60 x £62-66 depending on strength].

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.*

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: £6]. *NB: Evidence only supports use of modified-release, not immediate-release, dipyridamole preparations for prevention of vascular events.*

BNF 2.12 HMG CoA reductase inhibitors 'statins'

Licensed medicines in suitable formulations

Simvastatin 20mg/5ml [150ml: £119] and 40mg/5ml [150ml: £180] oral suspensions are available as licensed products; they are suitable for administration orally or via a feeding tube.

Atorvastatin 10mg and 20mg chewable tablets also available [30 x £14-27 depending on strength].

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 x 10mg, 20mg, 40mg <£2].

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.

BNF 4.1 Hypnotics

Licensed medicines in suitable formulations

Chloral hydrate 143.3mg/5ml elixir (*Welldorm* elixir) is suitable for administration orally or via a feeding tube [150ml: £233].

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: £11].
- Temazepam 10mg/5ml oral solution is suitable for administration orally or via a feeding tube [300ml: £85].

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].

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: £96].
- Aripiprazole oral solution is available [1mg/ml x 150ml: £102].
- 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: £37].
- Risperidone *orodispersible tablets* can be dispersed in water for administration orally or via a feeding tube [28 x tablets: £21-39 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: £66] 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].

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

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]. Fluoxetine 20mg dispersible tablets are also available [28 x £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: £7].
- 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: <£2].

Special-order medicines

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

BNF 4.8 Antiepileptic medicines**Clobazam****Licensed medicines in suitable formulations**

Clobazam 5mg/5ml [150ml: £90] and 10mg/5ml [150ml: £95] 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 <£3].

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: <£10].

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: £66].

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: £3-31 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 £97, all strengths].

Special-order medicines

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

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: £83].

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: £25, 30mg: <£1, 60mg: £7].

Special-order medicines

Alcohol-free phenobarbital oral liquid may be ordered from special-order manufacturing units (see back of BNF for contact details).

See HSCB Newsletter supplement on 'specials' for guidance on 'specials' prescribing and dispensing, available on the NI Formulary website [here](#)

6.1 Drugs used in diabetes

Metformin

Licensed medicines in suitable formulations

Metformin 500mg/5ml oral solution is available and can be given orally or via a feeding tube [150ml: £27].

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: <£2; 56 x 850mg: £3].

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: £78-94].

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].

References.

1. UKMi. Q&A 294.3. What are the therapeutic options for patients unable to take solid oral dosage forms? August 2013.
<https://www.evidence.nhs.uk/Search?q=%22medicines+Q%26As%22+ukmi>
2. NEWT Guidelines. Accessed 16/9/2015 <http://www.newtguidelines.com/> (subscription required)
3. BSO. Drug Tariff, September 2015. <http://www.hscbusiness.hscni.net/services/2034.htm>