SMTC Prescribing Formulary
2nd Edition – February 2018

SMTC - Prescribing Formulary
Introduction

This formulary has been developed and reviewed by the pharmacy department at SMTC.
It is intended to guide evidence-based and cost-effective prescribing across the Treatment Centre. Key points to note with regard to the formulary are:
It is intended to only cover first and in some cases second-line drug choices (other than where stated) for the treatment of most patients treated at the centre;
It is acknowledged that patients who are intolerant / unresponsive to formulary drugs, may require alternatives which are non-formulary;
New products will, by default, be non-formulary initially and prescribers are thus asked to refrain from prescribing new drugs until they have been assessed and approved for addition to the formulary;
The formulary is aimed at prescribing for adults;
The formulary is classified in chapters that follow the same scheme of the BNF when this is applicable to the SMTC prescribing needs;
Full prescribing information about products in the formulary is available in the British National Formulary (BNF) or in the SPC

ADMISSION AND DISCHARGE PROCESSES

Poor communication of information at transition points is responsible for as many as 50% of all medication errors and up to 20% of adverse drug events in hospital. The treatment centre has a process for medicines reconciliation before admission/discharge and a means of identifying patients at high risk of medicines related adverse events.

From Primary to Secondary Care

Complete patient details
The presenting condition plus co-morbidities
Follow the perioperative medicine management protocol
A list of all the medicines currently prescribed for the patient with indications
Any OTC medicines or supplements the patient takes
Dose, frequency and route of all the medicines listed
An indication of any medicines that are not intended to be continued (eg.acute prescriptions)
Known allergies
Known previous side effects
Medicines stopped and started, with reasons
Length of courses where appropriate
Details of increasing or decreasing regimes
Known allergies (and changes to this status where applicable)

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Therapeutic Area	Formulary Choices	Rationale/Comments
Chapter 1: Grastro-intestinal system		
Dyspepsia & gastro-oesophageal reflux disease **Related guidance: NICE CG184 (2014):Dyspepsia**		
NICE encourages people who need long-term management of dyspepsia symptoms to reduce their use of prescribed medication stepwise: by using the effective lowest dose, by trying 'as-needed' use when appropriate, and by returning to self-treatment with antacid and/or alginate therapy. Advise people that it may be appropriate for them to return to self-treatment with antacid and/or alginate therapy (either prescribed or purchased over-the-counter and taken as needed).		
Antacids	***Mucogel®***	Low sodium and cost-effective treatment for dyspepsia. At dose of 10-20ml tds & at bedtime provides equivalent magnesium intake required for hypomagnesaemia as an alternative to magnesium glycerophosphate.
Alginates	Peptac® (aniseed and peppermint flavour)	Contains 3.1mmol of sodium per 5ml so should be avoided in patients where restriction of sodium intake is desirable. Available OTC
	Acidex Advance® (aniseed and peppermint flavour)	Recommended dose: 5-10ml. Contains 2.3mmol sodium & 1mmol potassium per 5ml dose. Severe hypomagnesaemia has been reported infrequently in patients treated with PPIs, although the exact incidence is unknown. Where this is a clinical concern prescribers may also decide to use a magnesium containing product such as magnesium trisilicate or *Gastrocote*® (with alginate). NB: Magnesium salts tend to be laxative in effect.
Antispasmodics		
Antispasmodics	Mebeverine 135mg tablets	Avoid prescribing as *Colofac IBS*® as this is the OTC pack and more expensive.

Therapeutic Area	Formulary Choices	Rationale/Comments
Antisecretory drugs **Related guidance: Related guidance: NICE CG184 (2014):Dyspepsia**		
H_2 - receptor antagonists	**Ranitidine**	Ranitidine is recommended as first line treatment for mild-moderate GORD in the majority of patients. Ranitidine is available OTC, but only as 75mg tablets.
Proton pump inhibitors (PPI)		
Proton-pump inhibitors (NB. Refer to NICE guidance on use of PPIs)	Proton pump inhibitors may mask the symptoms of gastric cancer; particular care is required in those presenting with 'alarm features' and in such cases gastric malignancy should be ruled out before treatment. Patients at risk of osteoporosis should maintain an adequate intake of calcium and vitamin D, and, if necessary, receive other preventative therapy. Rebound acid hypersecretion and protracted dyspepsia may occur after stopping prolonged treatment with a proton pump inhibitor. In those at risk of ulceration when taking NSAIDS (over 65 and/or history of ulceration, a proton pump inhibitor can be considered for protection against gastric and duodenal ulcers associated with non-selective NSAIDs. A proton pump inhibitor should be prescribed for appropriate indications at the lowest effective dose for the shortest period; the need for long-term treatment should be reviewed periodically. Severe hypomagnesaemia may occur in patients treated with PPIs, although the exact incidence is unknown. Where this is a clinical concern, prescribers may also decide to use a magnesium containing product such as magnesium hydroxide (not suitable for patients with short bowel syndrome) or Mucogel (see previous page) **Deprescribing guidance**. Decision guides on whether PPIs can be deprescribed can be found on the medicines management website at http://www.somersetccg.nhs.uk/EasySiteWeb/GatewayLink.aspx?alId=6065	
	Lansoprazole capsules	Only use Lansoprazole orodispersible tablets (*Zoton FasTabs®*) as an alternative to costly special liquid formulations.
	Omeprazole capsules	Only use Omeprazole dispersible tablets (*Losec MUPS®*) as an alternative to costly special liquid formulations and where lansoprazole orodispersible tablets are not an acceptable alternative.

<table>
<tr><td rowspan="3"></td><td>As Mepradec®
or Mezzopram®</td><td>Where Omeprazole 20mg once-daily is not effective, increasing dose to 2x20mg daily (not 1x40mg) or using Lansoprazole 30mg daily is recommended.</td></tr>
<tr><td>Pantoprazole tablets</td><td>Pantoprazole has been included for circumstances where a tablet formulation is necessary. For patients currently taking Nexium® tablets who are unable to change to omeprazole, lansoprazole or pantoprazole, product should be prescribed as Ventra® capsules (esomeprazole capsules 20mg and 40mg)</td></tr>
<tr><td>Esomeprazole
as Ventra®</td><td></td></tr>
<tr><td rowspan="4">Helicobacter pylori eradication
First line</td><td>PPI & Amoxicillin (1g BD) + either Clarithromycin (500mg BD)
OR Metronidazole (400mg BD)</td><td rowspan="4">Treat all positives in known DU, GU or low grade MALToma. In Non-Ulcer NNT is 14.
Do not offer eradication for GORD.
First line treatment: choose the treatment regimen with the lowest acquisition cost, and take into account previous exposure to clarithromycin or metronidazole.
Do not use Clarithromycin, Metronidazole or Quinolone if used in past year for any infection.
Retest for H. pylori post DU/GU or relapse after second line therapy: using breath or stool test OR consider endoscopy for culture and susceptibility.
Seek advice from a gastroenterologist if eradication of H pylori is not successful with second-line treatment.

Always use PPI TWICE DAILY: Esomeprazole 20mg, Lansoprazole 30mg, Omeprazole 20-40mg, Pantoprazole 40mg

Duration of treatment-All for 7 days (MALToma 14 days).</td></tr>
<tr><td>Penicillin allergy
PPI & Metronidazole (400mg BD)
& Clarithromycin (500mg BD)</td></tr>
<tr><td>Penicillin allergy with previous exposure to Clarithromycin
> PPI & Bismuthate (De-noltab®) 240mg BD & Metronidazole 400mg BD & Tetracycline 500mg QDS</td></tr>
<tr><td>Second line:</td><td>(Still have symptoms after 1st line eradication):
PPI & Amoxicillin 1g BD + either Clarithromycin 500mg BD OR Metronidazole 400mg BD (whichever was not first line)</td></tr>
</table>

	Previous exposure to Clarithromycin & Metronidazole PPI & Amoxicillin (1g BD) + either Tetracycline (500mg QDS) ***OR*** Levofloxacin (250mg BD)	
	Penicillin allergy without previous exposure to Quinolone PPI & Metronidazole (400mg BD) & Levofloxacin (250mg BD)	
	Penicillin allergy with previous exposure to Quinolone PPI & Bismuthate (De-noltab®) 240mg BD & Metronidazole 400mg BD & Tetracycline 500mg QDS	
Acute diarrhoea		
Oral rehydration	***Electrolade®*** ***Dioralyte®***	Available as multipack containing mixed flavours. Available OTC.
Antimotility agents	Loperamide – suitable for self care	Available OTC as generic loperamide, various own-brand products and as Imodium®. Do not prescribe as branded version owing to high cost.
	Codeine	Just **three days** of codeine containing medicines can lead to addiction – The CCG strongly recommends that prescribers discuss the risk of addiction when initiating new patients on any opioid containing medication and that this discussion is recorded in the patient notes. Watch for increasing frequency of requests for prescriptions

Chronic bowel disorders **Related guidance: NICE CG 166 Ulcerative colitis: management in adults, children and young people**		
Patients receiving aminosalicylates should be advised to report any unexplained bleeding, bruising, purpura, sore throat, fever or malaise that occurs during treatment. A blood count should be performed and the drug stopped immediately if there is suspicion of a blood dyscrasia. In line with national guidance it is recommended that Mesalazine is prescribed by brand, however recent data suggests that Asacol MR and Octasa MR have very similar biovailability and could be switched and patient monitored for changes in symptoms. UKMI For all mesalazine preparations monitor renal function as recommended in SmPC.		
Aminosalicylates *First line*	Mesalazine as: Octasa MR 400mg tablets Pentasa SR 500mg tablets Salofalk 500mg sachets	Where 400mg tablets are required ***Octasa®*** tablets are recommended as first line as they are considered to be bioequivalent to the original product Asacol but at a lower cost. 800mg Octasa® cost more than 2 x 400mg so for cost-effective dose we recommend using 400mg tabs. Where 500mg tablets are required ***Pentasa®*** tablets are recommended. ***Salofalk®*** sachets: 1.5g equivalent to 2g pentasa or 2.4g Octasa® or Asacol® 3g equivalent to 4g Pentasa or 4.8g Octasa® or Asacol® Oral therapy alone is not as effective as a topical salicylate alone or a combined oral/topical combined treatment
Second line	Mesalazine as ***Mezavant® XL*** 1.2g tablets	Consultant initiation only (AMBER prescribing). All patients should have evaluation of renal function prior to initiation and at least twice yearly whilst on treatment.
Corticosteroids	Budesonide as *Budenofalk* Available as: 3mg capsules 2mg/100mL rectal foam 9mg GR granules sachets	Capsules enclose enteric coated granules which release budesonide into the ileum and ascending colon. Extraintestinal symptoms, e.g. involving the skin, eyes or joints, are unlikely to respond to Budenofalk 3mg because of its local action. Initial dose is 3mg tds for a maximum of 8 weeks. During week 7, dose should be reduced to two capsules daily and in week 8, reduce to one capsule daily. 9mg sachet dose is one per day sprinkled onto tongue 30 minutes before breakfast.

		Budesonide (and conventional glucocorticosteroid) should not be used to maintain remission NICE CG152
	Beclometasone dipropionate as Clipper 5mg tablets	**On consultant recommendation only**: To induce remission of left-sided or extensive ulcerative colitis as add-on therapy to 5-ASA containing drugs in accordance with NICE CG166. Maximum course of treatment is four weeks.
Special additive for conditions of intolerance	VSL#3 Powder 4.4g sachets	Nutritional supplement for use under the supervision of a physician, for the maintenance of remission of ileoanal pouchitis induced by antibacterials in adults.
Therapeutic Area	Formulary Choices	Rationale for decision / comments
Laxatives		
Stimulant laxatives (first line)	Bisacodyl (1st line))	Available OTC.
Second line	Senna Glycerol suppositries	Available OTC Glycerin suppository sizes: • 1g = infant • 2g = child • 4g = adult All available OTC
Osmotic laxatives	Macrogol (first line) as: *as **Laxido® Orange (sugar free)*** as **TransiSoft®** as ***Cosmocol® Orange sugar-free*** as ***Cosmocol®*** as ***Cosmocol Half®*** as ***Cosmocol Paediatric®***	NICE Cochrane QP review in June 2010 concluded that polyethylene glycol (macrogol) should be used in preference to lactulose for chronic constipation. Using polyethylene glycol in preference to lactulose is likely to improve the quality of patient care by reducing the use of a less effective treatment. Course of treatment for chronic constipation not normally > 2 weeks. A stimulant laxative should be added if disimpaction is not achieved after 2 weeks. Efficacy requires adequate fluid intake. Contains Na+, care in patients with hypertension / heart failure. ***Laxido®*** replaces Movicol® as lower cost brand equivalent. NICE says prescribe oral macrogols as first-line treatment for children and young people with newly diagnosed idiopathic constipation.

		As sugar free lemon/lime alternative to Laxido orange Half the dose of standard (minimum 12 years age) For children 2-11
Pre-op Bowel Cleansing Solutions		
Bowel cleansing medicine may modify the absorption of regularly prescribed medications. Urea and Electrolytes should be checked in all patients to minimise the risk of electrolyte imbalance particularly patients taking the following medications: Diuretics, corticosteroids, cardiac glycosides, NSAIDs, tricyclics, SSRIs, antipsychotics, carbamazepine.		
Macrogols	Klean-Prep Moviprep	Bowel evacuation before colonoscopy, surgery or radiological examination
Magnesium Citrate	Citramag	
Na Picosulfate with Mg Citrate	Citrafleet Picolax	Patients should be warned that heat is generated during reconstitution and that the solution should be allowed to cool before drinking Citrafleet and Picolax: bowel evacuation before surgery, radiolody or endoscopy
Local preparations for anal and rectal disorders		
Rectal soothing agents	Anusol®	Available OTC
Rectal Corticosteroids	Scheriproct	*Scheriproct®* is recommended over the traditionally widely used *Proctosedyl®,* as the latter is one of the most costly preparations of its type at £10.34 per tube.
Preparations for anal fissures	***Rectogesic®*** (Glyceryl Trinitrate Ointment 0.4%)	Glyceryl Trinitrate for the management of anal fissure should be prescribed as *Rectogesic®,* which is the only available licensed product for this indication. Prescriptions for other strengths will require the dispensing of "specials" which are unlicensed, often have a short shelf life and usually cost in excess of £100 per pack. Maximum duration of use: 8 weeks **All other external preparations of diltiazem are unlicensed specials and are non-formulary. Acute trust commissioned to provide full treatment course where patient deemed contraindicated to Rectogesic.**

Chapter 2: Cardiovascular system **Related guidance: NICE Clinical Guideline CG127 (2011): Hypertension: Clinical management of primary hypertension in adults** **NICE Clinical Guideline CG180 (2014): Atrial fibrillation** **NICE Clinical Guideline CG172 (2013): MI: secondary prevention** **NICE Clinical Guideline CG107 (2010): Hypertension in pregnancy** **NICE Clinical Guideline CG108 (2010): Chronic heart failure**		
Positive inotropic drugs		
Cardiac glycosides	**Digoxin**	Digoxin is included in the formulary for use: • Atrial fibrillation: but **not** paroxysmal AF • Heart failure: where symptoms persist (due to LVSD) despite optimum therapy including ACEIs, B-Blockers and diuretics. U&Es should be checked at least 6-monthly, or when drug treatment is changed. Monitoring serum potassium is particularly important in patients' taking digoxin or an aldosterone antagonist. A serum digoxin level should be measured within 8-12 hours of the latest dose **only** if toxicity or non-adherence is suspected. Doses of greater than 250mcg per day in adults and greater than 125mcg in patients over 70years should rarely be seen. Update from NICE: **Rate control** 1.Offer either a standard beta-blocker (that is, a beta-blocker other than sotalol) or a rate-limiting calcium-channel blocker as initial monotherapy to people with atrial fibrillation who need drug treatment as part of a rate control strategy. 2.Base the choice of drug on the person's symptoms, heart rate, comorbidities and preferences when considering drug treatment. [new 2014] 3.Consider digoxin monotherapy for people with non-paroxysmal atrial fibrillation only if they are sedentary (do no or very little physical exercise). [new 2014] 4.If monotherapy does not control symptoms, and if continuing symptoms are thought to be due to poor ventricular rate control, consider combination therapy with any 2 of the following: -a beta-blocker -diltiazem -digoxin. [new 2014] 5.Do not offer amiodarone for long-term rate control. [new 2014]
Diuretics		
Thiazides and related diuretics	**Indapamide**	• Hypertension: indapamide 2.5mg daily is considered the optimal dose for hypertension. Low dose indapamide 1.5mg SR has been shown to control hypertension as effectively as 2.5mg (IR) with lower incidence of hypokalaemia. http://www.ncbi.nlm.nih.gov/pubmed/8572850
	Bendroflumethiazide	People treated with bendroflumethiazide whose blood pressure is stable & well controlled should continue on bendroflumethiazide. **Heart failure**: bendroflumethiazide may have a limited role in mild heart failure or where patients are intolerant of loop diuretics
	Metolazone	No longer marketed in UK but remains on formulary for consultant recommendation *(Amber drug in the TLG.)*

Loop Diuretics	**Furosemide**	Furosemide is included in the formulary for use • Heart failure: to provide relief of symptoms. Patients' who do not respond to 80mg/day will require further specialist advice. • Hypertension: For treatment of resistant hypertension at Step 4 where BP remains sub-optimally controlled despite standard therapies.
Aldosterone Antagonists	**Spironolactone**	Spironolactone is included in the formulary for: • Heart failure: second line for specialist initiation in heart failure due to left ventricular systolic dysfunction. Closely monitor potassium and creatinine levels, and eGFR. • Hypertension: For treatment of resistant hypertension at step 4 if blood potassium is ≤ 4.5mmol/l Monitor electrolytes—discontinue if hyperkalaemia occurs (in severe heart failure monitor potassium and creatinine 1 week after initiation and after any dose increase, monthly for first 3 months, then every 3 months for 1 year, and then every 6 months). **MHRA alert (Feb 2016)** includes the following reminder: •Concomitant use of spironolactone with ACEi or ARB is not routinely recommended because of the risks of severe hyperkalaemia, particularly in patients with marked renal impairment •Use the lowest effective doses of spironolactone and ACEi or ARB if coadministration is considered essential •Regularly monitor serum potassium levels and renal function •Interrupt or discontinue treatment in the event of hyperkalaemia
	Eplerone	As an alternative to spironolactone, where sex hormone mediated adverse effects experienced when used, in addition to standard therapy, to reduce the risk of cardiovascular mortality and morbidity after recent myocardial infarction in stable patients with left ventricular dysfunction and clinical evidence of heart failure.
Anti-arrhythmic drugs		
Drugs for arrythmias	**Amiodarone**	Treatment should only be initiated by a hospital specialist and only for the treatment of severe rhythm disorders not responding to other therapies. Prescribing at initial loading dose should be limited to 2 weeks and provided by specialist. Care should be taken to ensure that only the **ongoing dose** is used for prescribing by any other doctor. Amiodarone therapy requires monitoring of: • LFTs and TFTs at baseline and then every 6 months. • Ophthalmic examination at baseline and then twelve-monthly The long half-life of amiodarone (~50 days) means the therapeutic and adverse effects persist for long periods after discontinuation of therapy. **WARNING** Do not exceed Simvastatin **20mg** in patients taking amiodarone and monitor lipid

		levels to ensure lowest dose necessary of simvastatin is used.
	Dronedarone	Although effective in treating atrial fibrillation and flutter, dronedarone is not as effective as amiodarone. However, the different side effect profile has led to its use in patients for whom amiodarone may be contraindicated or otherwise unsuitable. Dronedarone is indicated for the maintenance of sinus rhythm after successful cardioversion in adult clinically stable patients with paroxysmal or persistent atrial fibrillation (AF). Due to its safety profile (see sections 4.3 and 4.4), dronedarone should only be prescribed after alternative treatment options have been considered. Dronedarone must not be given to patients with left ventricular systolic dysfunction or to patients with current or previous episodes of heart failure. Careful monitoring during dronedarone administration is recommended by regular assessment of cardiac, hepatic and pulmonary function (see below). If AF reoccurs discontinuation of dronedarone should be considered. Treatment with dronedarone should be stopped during the course of treatment, in case the patient develops any of the conditions which would lead to a contraindication as mentioned in section 4.3. Monitoring of co-administered medicinal products like digoxin and anti-coagulants is necessary. See the SPC for further information. Also MHRA Alert Dronedarone (10/2011) See NICE guidance TA197 for more information: NICE TAG
Beta-adrenoreceptor blocking drugs		
Beta blockers may be considered as initial therapy for hypertension particularly if intolerant or C/I to ACEI/ARB for: younger people (under 55) women of childbearing age people with evidence of increased sympathetic drive Cardioselective beta-blockers may be used in well-controlled asthmatic patients, or COPD without significant reversible component for Heart Failure or following an MI. Treatment should be initiated at a low-dose & the patient monitored carefully for adverse effects. Recent evidence-based guidance for angina states that beta-blockers should be the first line therapy for the long-term prevention of angina. Patients with heart failure should only be prescribed with beta-blockers licensed for this indication		
Beta-blockers	**Bisoprolol**	**Heart failure**: Patients with heart failure should be prescribed a beta-blocker licensed for heart failure. Bisoprolol is first line drug, initiated at 1.25mg. **Hypertension**: in line with NICE guidance. Alternative to Atenolol or Metoprolol **Angina**: as alternative to Metoprolol **Post-MI**: as alternative to Metoprolol
	Atenolol	**Hypertension**: in line with NICE guidance. Atenolol dose for hypertension should not normally exceed 50mg daily **Angina**: for prophylaxis of symptoms, some additional benefit may be obtained by increasing the dose to 100mg

	Metoprolol	**Hypertension**: in line with NICE guidance. Alternative to Atenolol or Bisoprolol **Angina**: as alternative to Bisoprolol **Post-MI**: as alternative to Bisoprolol
Drugs affecting the renin-angiotensin system and other antihypertensives		
ACE-inhibitors (ACEIs) should be used in line with NICE guidance for hypertension and heart failure. All should be prescribed in a single daily dose where possible. Lisinopril and Ramipril are the recommended first line options. Monitoring requirements U+Es at baseline, repeated 1-2 weeks after each dose increase for heart failure and after final dose increase in hypertension, annually thereafter **Patients exhibiting ACE cough on first choice ACEI should trial a second choice ACEI before an ARB**		
ACE-inhibitors	**Lisinopril**	Hypertension: in line with NICE guidance. Usual dose range 2.5mg-20mg daily. May be commenced at dose of 10mg daily in patients without renal impairment and not on diuretics. Post-MI: titrated to 5-10mg daily if possible Heart failure: as guidelines, titrated to 35mg if possible Diabetic nephropathy: initially 2.5mg once daily, adjusted to achieve sitting diastolic BP of <75mmHg in normotensive IDDM and <90mm Hg in hypertensive NIDDM.
	ramipril	Ramipril is included in the formulary for: • Hypertension: 1.25mg to 10mg daily, in line with NICE guidance. • Post-MI: titrated to 10mg daily if possible • Heart failure: Start ACE inhibitor therapy at a low dose and titrate upwards at short intervals (for example, every 2 weeks) until the optimal tolerated or target dose is achieved
	Perindopril Erbumine tablets (Ensure Perindopril is prescribed as Perindopril Erbumine, rather than Perindopril Arginine, which is more expensive.)	Perindopril Erbumine is included in the formulary for: Hypertension:Treatment of hypertension Heart failure:Treatment of symptomatic heart failure. Start ACE inhibitor therapy at a low dose and titrate upwards at short intervals (for example, every 2 weeks) until the optimal tolerated or target dose is achieved Stable Coronary Artery Disease: Reduction of risk of cardiac events in patients with a history of myocardial infarction and/or revascularisation.
ARBs should **only** be used in patients with persistent troublesome ACEI induced cough. The percentage of patients reporting a cough was between 2-10% in randomised controlled trials. **Dual therapy ACEI+ARB is not recommended for any indication, other than under specific conditions for patients with heart failure. (NICE CG108 2010)**		
Angiotensin-II receptor blockers (ARBs)	**Losartan (1st line)**	Losartan is included in the formulary for: • Hypertension: (where intolerant to ACEI except for people of African or Caribbean origin at step 2 where ARB are preferred to ACE) in line with NICE guidance, dose range 25-100mg once daily • Renal protection in Type 2 DM with nephropathy: (where intolerant to ACEI) initially 50mg daily, increased after one month to 100mg daily according to blood pressure • Heart failure: (>60 yrs; ACE intolerant; LVEF <40% & clinically stable). Patients with heart failure who have been stabilised with an ACE inhibitor should not be switched to losartan. Initially 12.5mg, titrated at weekly intervals to usual maintenance dose of 50mg, as tolerated by patient.
	Candesartan (2nd line)	Candesartan is included in the formulary for: • Hypertension: (where intolerant to ACEI) in line with NICE guidance, dose range 2-16mg

		daily • Heart failure: (where intolerant to ACEI) as per guidelines, titrated to 32mg daily if possible.
	Valsartan (3rd line)	Valsartan is only included in the formulary for: • Post-MI: (where symptomatic heart failure and intolerant to ACEI), initially 20mg bd, titrated to 160mg bd where tolerated • **Not included for hypertension**
	Sacubitrl/ Valsartan	Draft NICE guidance published Dec 15 provisionally recommended Sacubitril Valsartan for treating chronic heart failure with reduced ejection fraction in people with New York Heart Association class II to III symptoms who are on a stable dose of ACE inhibitors (or angiotensin II receptor blockers for people who are intolerant of ACE inhibitors) and who have a left ventricular ejection fraction of 35% or less. Approved for use in Somerset after specialist initiation (PAMM Jan 16). Shared care agreement **Remember to stop original ACEi or ARB medication**
Centrally acting antihypertensive drugs	**Methyldopa**	Methyldopa is included in the formulary for: • Hypertension in pregnancy
	Moxonidine	Moxonidine is included in the formulary for: • Hypertension: For treatment of resistant hypertension at Step 4 where BP remains sub-optimally controlled despite standard therapies.
Alpha-blockers	**Doxazosin**	Alpha blocker monotherapy is not recommended. Doxazosin is included in the formulary for: • Hypertension: For treatment of resistant hypertension at Step 4 where BP remains sub-optimally controlled despite standard therapies. • Benign prostatic hyperplasia: See section 7 NB. Doxazosin MR (Cardura XL®) tablets are specifically not recommended for maintenance in hypertension and maximum licensed dose for other indications is 8mg. Stabilised hypertensive patients on Doxazosin MR tablets should be switched to standard 4mg tablets: • Doxazosin MR 4mg one daily → Doxazosin 4mg one daily • Doxazosin MR 8mg one daily → Doxazosin 4mg two daily
Nitrates, calcium channel blockers and potassium channel activators		
Nitrates	**Glyceryl trinitrate (GTN) spray/tablets**	Glyceryl trinitrate is included in the formulary for: • Angina: for as required use for relief of symptoms Note that GTN tablets are now significantly more costly than spray, and aerosol spray is twice price of spray pump
	Isosorbide mononitrate (instant or modified release)	Isosorbide Mononitrate is included in the formulary for: Angina: for prophylaxis of symptoms as monotherapy where intolerance or C/I to use of a beta-blocker or rate-limiting CCB. As combination therapy with beta-blocker or CCB where monotherapy provides insufficient control. First line is to prescribe standard Isosorbide mononitrate tablets asymmetrically to ensure a

		nitrate free period is maintained to reduce nitrate tolerance e.g. 20mg bd at 6-8am and 2-4pm.
	Sustained-release release as Tardisc XL **Or Monomil XL**	If patients cannot comply with this regime, MR preparations should be prescribed by brand (*Tardisc XL®* OR *Monomil XL®* for 60mg) and only given **once-daily** to reduce nitrate tolerance. Where Isosorbide mononitrate has been added to provide symptom control pending angioplasty or CABG, consideration should be given to cautious withdrawal after successful completion of and recovery from the procedure **ISOSORBIDE DINITRATE is NON FORMULARY except where initiated by a specialist for left ventricular failure**
Calcium channel blockers		
Dihydropyridines	**Amlodipine** **Lercanidipine** **Nifedipine** **Nimodipine** **Lacidipine** **Felodipine**	**NB. Avoid short-acting dihydropyridines in BP, CHD and CCF.** Amlodipine is first line CCB, with lercanidipine as a second line option for: • Hypertension: in line with NICE guidance • Angina: as monotherapy where intolerance or C/I to use of a beta-blocker or rate-limiting CCB. As combination therapy with beta-blocker where monotherapy provides insufficient control. NB: When prescribing Amlodipine generically, this should be as plain Amlodipine. Prescriptions for Amlodipine besilate will result in the supply of *Istin®* and incur significantly greater costs.
Rate limiting	**Verapamil** **Diltiazem (immediate and modified release)**	Diltiazem MR (as *Zemtard XL®*) is included in the formulary for: • Angina: as monotherapy where intolerance or C/I to use of a beta-blocker. In combination with a beta-blocker where monotherapy provides insufficient control. NB: Caution required due to risk of bradycardia and heart-block. • Hypertension: For treatment of resistant hypertension at Step 4 where BP remains sub-optimally controlled despite standard therapies. NB. Prescribing Diltiazem MR as the formulary preferred ***Zemtard XL®*** brand ensures continuity of supply, as recommended nationally. Verapamil should **not** be combined with a beta-blocker for **any** indication due to high risk of bradycardia and heart-block Verapamil is included in the formulary for: • Angina: as monotherapy where intolerance or C/I to use of a beta-blocker. • Hypertension: For treatment of resistant hypertension at Step 4 where BP remains sub-optimally controlled despite standard therapies.

Other antianginal drugs		
Potassium Channel Activator	**Nicorandil**	Where Nicorandil has been added for symptom control pending angioplasty or CABG, strong consideration should be given to cautious withdrawal after successful completion of and recovery from the procedure. Nicorandil is associated with oral, anal, gi & para-stomal ulceration & delayed wound healing. Addition of a PPI is ineffective to promote healing – cessation of the drug is needed. Also see MHRA alert Jan 16: risk of ulcer complications with Nicorandil
Sinus Node Regulator	**Ivabradine**	GREEN for medical management of Stable angina: in line with NICE CG126 See guide on previous page AMBER for management of heart failure see Prescribing Guidelines for Heart Failure. • QT prolongation may be exacerbated by heart rate reduction. The use of ivabradine with other drugs which prolong QT interval eg citalopram, diltiazem, should be avoided. • If the combination appears necessary, close cardiac monitoring is needed. • Hypokalaemia and hypomagnesaemia can increase the risk of arrhythmia especially in patients with long QT interval, whether congenital or substance-induced eg with potassium-depleting diuretics (thiazide diuretics and loop diuretics). Caution & careful monitoring is needed.
Other	**Ranolazine**	Included for medical management of stable angina: in line with NICE CG126 See guide on previous page.
Peripheral Vasodilators and related drugs		
Vasodilators	**Naftidrofuryl**	Naftidrofuryl oxalate is recommended as an option for the treatment of intermittent claudication in people with peripheral arterial disease for whom vasodilator therapy is considered appropriate after taking into account other treatment options (NICE TA223) Cilostazol, pentoxifylline and inositol nicotinate are **not recommended** for the treatment of intermittent claudication in people with peripheral arterial disease.
Anticoagulant drugs and protamine		
Parental anticoagulants	**Related guidance: NICE Clinical Guideline CG92 (2010): Venous thromboembolism – reducing the risk**	
	Enoxaparin (PFS)	Enoxaparin is licensed for the prophylaxis and treatment of venous thromboembolism; treatment of unstable angina, non-Q-wave myocardial infarction, acute ST-segment elevation myocardial infarction (STEMI); prevention of thrombus formation in the extracorporeal circulation during haemodialysis. NB. Dalteparin is licensed for treatment of symptomatic VTE and prevention of its recurrence, in patients with solid tumours
Protamine	**Protamine sulfate** is used to treat overdosage of unfractionated or low molecular weight heparin. The long half-life of low molecular weight heparins should be taken into consideration.	

Management of haemorrhage: haemorrhage is the main adverse effect of all oral anticoagulants. Checking the INR and omitting doses is essential. If the anticoagulant is stopped but not reversed, the INR should be checked again after 2 to 3 days to ensure that it is falling. The following recommendations apply to patients taking Warfarin and are based on the result of the INR and whether there is major or minor bleeding: Major bleeding: stop Warfarin; give Phytomenadione (Vitamin K1) 5-10mg by slow intra-venous injection; give prothrombin complex concentrate (factors II, VII, IX and X) 30-50units/kg (or if no concentrate available) fresh frozen plasma 15ml/kg. INR> 8.0, no bleeding or minor bleeding: stop Warfarin, re-start when INR < 5. If there are other risk factors for bleeding, give Phytomenadione (Vitamin K1) 500mcg by slow intra-venous injection or 5mg by mouth, (for partial reversal of anticoagulation give smaller oral doses of Phytomenadione e.g. 0.5mg - 2.5mg, using the intravenous p reparation orally); repeat dose of Phytomenadione if INR still too high after 24 hours. See Chapter 9 for details of Phytomenadione preparations on the formulary.		
Oral anticoagulants		
Coumarins	**Management of patients on warfarin should be in line with the National Enhanced Service specification and company policy.**	
	Warfarin	Warfarin indications and target INR: Atrial fibrillation: target INR = 2.5 Treatment of DVT or PE: target INR = 2.5 Recurrent DVT or PE: target INR = 3.5 Mechanical prosthetic heart valves: target INR dependent on type and location of valve. Generally a target INR of 3 is recommended for mechanical aortic valves and a target INR of 3.5 for mechanical mitral valves
New Oral AntiCoagulants (NOACs) **Direct thrombin Inhibitor**	**Dabigatran**	Dabigatran is included for • Prevention of stroke & systemic embolism for people with non-valvular atrial fibrillation where patients fit the criteria in NICE TA249. See Implementation priorities. • Treatment of DVT and PE, and prevention of recurrent DVT and PE in adults. See TA327 *See note above for use post elective hip & knee replacement* (NICE TA157). * Link to SPC
Specific reversal agent for dabigatrin	**Idarucizumab**	**For secondary care use only: RED DRUG** Praxbind is a specific reversal agent for dabigatran and is indicated in adult patients treated with Pradaxa (dabigatran etexilate) when rapid reversal of its anticoagulant effects is required: • For emergency surgery/urgent procedures • In life-threatening or uncontrolled bleeding.
Direct inhibitor of activated Factor X (Xa)	**Rivaroxaban**	• For the prevention of stroke & systemic embolism for people with non-valvular atrial fibrillation in accordance withNICE TA256. See below for implementation priorities *and;* • For treating and preventing deep vein thrombosis (DVT) and pulmonary embolism (PE) for adults in accordance with NICE TA261 *and;* • An option for treating pulmonary embolism and preventing recurrent deep vein thrombosis

		and pulmonary embolism in adults in accordance with NICE TA287 *and;* • As an option to treat signs and symptoms of DVT *and;* • 15mg and 20mg strengths for prevention of cardiovascular disease in patients with atrial fibrillation undergoing cardioversion *See note above for use post elective hip & knee replacement* (NICE TA170)
	Apixaban	Apixaban is included for the prevention of stroke and systemic embolism in adult patients with non-valvular atrial fibrillation, with one or more risk factors, such as prior stroke or transient ischaemic attack (TIA); age ≥ 75 years; *See note above for use post elective hip & knee replacement* (NICE TA245). For the treatment and secondary prevention of deep vein thrombosis and/or pulmonary embolism NICE TA341 (June 2015)
	Edoxaban	Edoxaban is included for prevention of stroke and systemic embolism in adult patients with non-valvular atrial fibrillation (NVAF), with one or more risk factors, such as congestive heart failure, hypertension, age ≥ 75 years, diabetes mellitus, prior stroke or transient ischaemic attack (TIA). See NICE TA355 (Sept 15) Treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE), and prevention of recurrent DVT and PE in adults. NICE TA354
Antiplatelet drugs	**Related guidance: NICE Technology Appraisal TAG210 (2010): Clopidogrel and modified-release dipyridamole**	
Anti-platelet drugs	**Aspirin** (Consideration should be given to providing PPI cover for patients on antiplatelets to minimise risk of GI bleeds)	**ATT meta-analysis : Aspirin for primary prevention of CVD** Aspirin is not licensed for the primary prevention of vascular events but there remains the possibility for particular sub-groups of individuals at higher CV risk that the risk:benefit of aspirin is favourable. Until more evidence is available, the use of Aspirin 75mg for primary prevention should be based on an individual risk assessment. NICE NG28 Type 2 diabetes in adults: management (2015) recommends that antiplatelet therapy (aspirin or clopidogrel) should not be offered to adults with type 2 diabetes without cardiovascular disease. Aspirin is included in the formulary for: - Secondary prevention of CV events: see notes regarding use in combination with Dipyridamole or Clopidogrel below NB There is evidence that:

		- Aspirin doses >75mg daily increase GI toxicity and general bleed risk **Enteric-coated Aspirin does not reduce GI events and may be less effective**
	Clopidogrel	Clopidogrel is recommended byNICE as an option to prevent occlusive vascular events; - for people who have had an ischaemic stroke or who have peripheral arterial disease or multivascular disease **or TIA(off license criteria apply for individual patient assessment)** Clopidogrel is also included in the formulary for: - patients with **true** aspirin allergy who require secondary prevention of cardiac or vascular disease - patients who have had an NSTEMI, regardless of treatment (up to 12 months) - patients who have had a STEMI **and** received a bare-metal or drug-eluting stent for up to 12 months (new for 2013) - patients who have had a STEMI and medical management with or without reperfusion treatment with a fibrinolytic agent [new 2013] (at least 1 month and up to 12 months). • - alternative to aspirin in people who also have other clinical vascular disease, in line withClopidogrel and modified-release dipyridamole for the prevention of occlusive vascular events (NICE TA 210), and who have: - had an MI and stopped dual antiplatelet therapy or - had an MI more than 12 months ago [new 2013]. In all cases where clopidogrel is initially used in combination with aspirin, when the clopidogrel is stopped, anti-platelet therapy continues with aspirin 75mg daily alone. Patients requiring treatment with clopidogrel and PPI should avoid omeprazole and esomeprazole which may reduce the effects of clopidogrel on platelet function and lead to poorer long-term patient outcomes (death and readmission). The effect of clopidogrel is also antagonised by calcium-channel blockers and some statins
	Dipyridamole m/r or in combination with aspirin	Modified-release dipyridamole alone is recommended byNICE as an option to prevent occlusive vascular events; - for people who have had an ischaemic stroke only if aspirin and clopidogrel are contraindicated or not tolerated **or** - for people who have had a transient ischaemic attack only if aspirin is contraindicated or not tolerated, or if clopidogrel (unlicensed use) has been excluded.
	Prasugrel	APrasugrel 10mg in combination with aspirin is recommended as an option for preventing atherothrombotic events in people with acute coronary syndromes having percutaneous coronary intervention, only when: • immediate primary percutaneous coronary intervention for ST-segment-elevation myocardial infarction is necessary or • stent thrombosis has occurred during clopidogrel treatment or • the patient has diabetes mellitus. Treatment should continue for **12 months** unless discontinued earlier, e.g. for side effects (NICE TA317: Acute coronary syndrome - prasugrel)

	Ticagrelor	Ticagrelor in combination with low-dose aspirin is recommended **for up to 12 months**as a treatment option in adults with acute coronary syndromes (ACS) as follows: • with ST-segment-elevation myocardial infarction (STEMI) or; •with non-ST-segment-elevation myocardial infarction (NSTEMI) or admitted to hospital with unstable angina – defined as ST or T wave changes on electrocardiogram suggestive of ischaemia plus one of the characteristics defined in guidance. Before ticagrelor is continued beyond the initial treatment, the diagnosis of unstable angina should first be confirmed, ideally by a cardiologist. See NICE TA236: Ticagrelor for the treatment of acute coronary syndromes
Antifibrinolytic drugs and haemostatics		
Tranexamic acid	Massive haematuria is a risk, avoid if risk of ureteric obstruction is present.	
Prothrombin Complex		
Lipid-regulating drugs.		
People on a statin should be advised to seek medical advice if they develop muscle symptoms (pain, tenderness or weakness). If this occurs, creatine kinase should be measured. Baseline liver enzymes should be measured before starting a statin. Liver function (transaminases) should be measured within 3 months of starting treatment and at 12 months, but not again unless clinically indicated. If a person develops an unexplained peripheral neuropathy, statins should be discontinued and specialist advice sought		
Statins	**Atorvastatin (first line)**	**Atorvastatin is first line statin for all new patients unless contra-indicated.** It is included in the formulary for: • Hypercholesterolaemia • Primary prevention of cardiovascular events (where 10 year CVD risk ≥ 10%) • Secondary prevention of CV events (give 80mg)
	Simvastatin (first line)	Please note: • Simvastatin should be prescribed at night to optimise effect. • Simvastatin 10mg should only be prescribed for patients who cannot tolerate a higher evidence-based dose of statin therapy • **Simvastatin doses should not exceed 20mg for patients on Amiodarone, Verapamil, Amlodipine or Diltiazem** • See BNF or SPC for further information on interactions • There is an increased risk of myopathy associated with high-dose (80mg) simvastatin. The 80mg dose should be considered only in patients with severe hypercholesterolaemia and high risk of cardiovascular complications who have not achieved their treatment goals on

		lower doses, when the benefits are expected to outweigh the potential risks. (see MHRA Drug Safety Update May 2010; 3 (10))
	Pravastatin (second line)	It should be noted that the maximum reduction in total cholesterol which can be expected from Pravastatin is 24%. However, pravastatin is not liver metabolised like the others, which may explain why it is generally better tolerated.
	Rosuvastatin (third line)	Higher intensity statins should not routinely be offered to people for the primary prevention of CVD. A target for total or LDL cholesterol is not recommended for people who are treated with a statin for **primary prevention of CVD.** Rosuvastatin is contra-indicated in patients with severe renal impairment (creatinine clearance <30 ml/min. The 40mg dose is contra-indicated in moderate renal impairment (creatinine clearance < 60 ml/min). Pravastatin and Rosuvastatin have a different metabolic pathway so may be tolerated when Simvastatin or Atorvastatin are not.
	Fluvastatin	
Other lipid lowering drugs	**Ezetimibe**	Ezetimibe monotherapy is recommended as an option for treating primary (heterozygous-familial or non-familial) hypercholesterolaemia in adults in whom initial statin therapy is contraindicated. Ezetimibe monotherapy is recommended as an option for treating primary (heterozygous-familial or non-familial) hypercholesterolaemia in adults who cannot tolerate statin therapy, defined as the presence ofclinically significant adverse effects that represent an unacceptable risk to the patient or that may reduce compliance with therapy. Ezetimibe, co-administered with initial statin therapy, is recommended as an option for treating primary (heterozygous-familial or non-familial) hypercholesterolaemia in adults who have started statin therapy when: 1. serum total or low-density lipoprotein (LDL) cholesterol concentration is not appropriately controlled (defined as based on individual risk assessment according to national guidance on managing CV disease in the relevant populations) either after appropriate dose titration of initial statin therapy or because dose titration is limited by intolerance to the initial statin therapy and 2. a change from initial statin therapy to an alternative statin is being considered. Healthcare professionals should offer adults with FH a referral to a specialist with expertise

		in FH if treatment with the maximum tolerated dose of a high-intensity statin and ezetimibe does not achieve a recommended reduction in LDL-C concentration of greater than 50% from baseline (that is, LDL-C concentration before treatment). Local specialist advice is to also consider checking triglyceride levels & consider fibrate. See NICE CG 71 July 2016 for further information **The ENHANCE study showed the addition of Ezetimibe had no effect on primary or secondary endpoints and emerging evidence contributes to lack of positive cardiovascular outcomes with ezetimibe alone.**
Fibrates	**Fenofibrate Micronized**	Consider use only in severe hypertriglyceridaemia. Do not routinely offer fibrates for the prevention of CVD to any of the following: • people who are being treated for primary prevention • people who are being treated for secondary prevention • people with CKD • people with type 1 diabetes • people with type 2 diabetes.
	Nicotinic Acid	These lipid lowering drugs are usually initiated in secondary care by clinical biochemists for patients with complex dyslipidaemias. Nicotinic acid and bile acid sequestrants : do not use as for fibrates above
Bile acid sequestrants	**Colestyramine**	As above with nicotinic acid.

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 3 Respiratory System **Related guidance: NICE Technology Appraisal TAG138 (2008): Asthma (in adults) - corticosteroids** **BTS / SIGN Guideline 141 (October 2014): British Guideline on the Management of Asthma**		
Safer use of inhaled corticosteroids (ICS) ALL patients on high dose ICS (ie > 1000mcg beclomethasone or equivalent daily) should be issued with a Steroid Card. ICS can have serious side effects: one study has shown an increased risk of diabetes onset and progression. Stepping-down asthma therapy helps reduce the ICS dose and can be considered in patients with complete asthma control (for at least 12 weeks). For patients on combination therapy the preferred approach is to reduce the ICS by approximately 50% while continuing LABA at the same dose initially. **Different ICS have different potencies and the equivalent dose can also vary between devices.**		
Bronchodilators		
Short acting β_2 agonist bronchodilators (SABAs)	**Salbutamol CFC free MDI (1st line)**	*First line:* MDI (plus spacer if necessary) on grounds of cost If patient cannot manage an MDI plus spacer, consider a breath-activated MDI or a dry powder device.
	Salbutamol (Breath actuated as Airomir Autohaler **as Salamol Easi-Breathe** **as Salbutamol Easyhaler**	
Long acting β_2 agonist bronchodilators (LABAs)	**Formoterol**	**Formoterol is the first line LABA as Easyhaler**. Maintenance dose is 12mcg once or twice daily.
	Salmeterol **Indacaterol** **Olodaterol**	**Salmeterol is the second line LABA to formoterol** Licensed over the **age of 12 years**. Avoid in patients with nut allergy as contains lecithin. Accuhaler licensed from 4 years as is Serevent MDI inhaler. Formoterol is preferred. **Indacaterol** is indicated for maintenance bronchodilator treatment of airflow obstruction in adult patients with COPD. This is a cost neutral alternative to established treatments and may be appropriate for patients for whom **once-daily** administration is appropriate, especially those not requiring inhaled corticosteroids. It has been approved by the SMC Olofaterol - Adults over 18, 2 puffs twice a day

<u>Short acting</u> anticholinergic bronchodilators	**Ipratropium**	Do not co-prescribe Ipratropium with Tiotropium because of risk of increased anticholingeric adverse effects.
<u>Long acting</u> Anticholinergic bronchodilators	**Aclidinium bromide** **Glycopyrronium bromide** **Tiotropium** **Umeclidinium**	Aclidinium is licensed for the maintenance treatment of COPD. The dose is 400mcg bd. The device may be suitable for some patients who are unable to use a ***Handihaler®***. NB. Each 400 mcg metered inhalation of aclidinium bromide delivers 322 mcg of aclidinium Glycopyrronium is licensed for the maintenance treatment of COPD. The dose is 50mcg od. Each 50 microgram capsule delivers a dose of 44 micrograms of glycopyrronium ***Braltus Zonda®*** delivers 10mcg tiotropium to the lungs and is dose equivalent to the 18mcg tiotropium Handyhaler. Tiotropium is licensed for use in COPD and asthma. Use in COPD should be in line with the local COPD guidance, which is consistent with the NICE guidance, see here for more information. May be used in asthma as an alternative to increasing ICS dose. Ask for specialist guidance. If no benefit after trial period, stop treatment. Tiotropium should **not** be combined with ipratropium due to increased risk of anticholinergic side-effects **Tiotropium*Spiriva Respimat®***(soft-mist inhaler) was included in the formulary for patient choice. The recommended dose in adults (also the maximum dose) is one inhalation of Incruse Ellipta once daily at the same time of the day each day.
Theophylline MR	Reduce the dose of theophyline if macrolide or quinolones antibiotics (or other drugs known to interact) are prescribed to treat an exacerbation. The rate of absorption from modified-release preparations can vary between brands	
	Theophylline can be used in combination with β_2 agonists and muscarinic antagonists. Please note, the risk of hypokalaemia is increased when theophylline is given in combination with a β_2 agonist	
LAMA and LABA combinations	**Anoro Ellipta (Umeclidinium/vilanterol)**	Once daily dose. Maintenance bronchodilator treatment to relieve symptoms in adult patients with chronic obstructive pulmonary disease (COPD)
	Duaklir Genuair (Aclidinium/formoterol)	Twice daily dose. COPD only.

	Ultibro Breezhale (Glycopyrronium/indacterol)	Once daily dose. Indicated as a maintenance bronchodilator treatment to relieve symptoms in adult patients with (COPD).Capsule has to be placed into device, needs certain dexterity.
	Spiolto Respimat (tiotropium/olodaterol)	Two puffs once daily.
Aminophylline	**Aminophylline MR**	
Corticosteroids		
Inhaled corticosteroids (ICS)	**Beclometasone**	Prescribe beclometasone MDIs by brand name to avoid confusion over the product intended. ***Clenil Modulite*® and *Qvar*® are not equipotent**
	Budesonide	Licensed from age 6 years. In patients already controlled on inhaled corticosteroids (eg budesonide or beclometasone dipropionate) administered twice daily, once daily dosing up to 800 micrograms may be used.
Combination long-acting β-agonist steroid inhalers	***Flutiform*®** (Fluticasone / Formoterol)	
	***Fostair*®** (Beclomethasone / Formeterol)	
	Fostair NEXThaler® (Beclomethasone / Formeterol) ultrafine dry powder inhaler	Asthma only. **Fostair** (MDI) is also licensed for use in COPD.
	***Relvar*® *Ellipta*®** (Fluticasone furoate/vilanterol) Dry powder inhaler	Long acting once daily dosage due to the long acting furoate salt and LABA. Dose equivalent to 500mcg daily fluticasone proprionate (1000mcg BDP)
	Duoresp*®*Spiromax® Budesonide/formoterol	Alternative to Symbicort Turbohaler. 160/4.5 is comparative to Symbicort 200/6 and 320/9 is comparative to 400/12. Can be used as maintenance or maintenance and reliever therapy. License in asthma and COPD (COPD
	***Symbicort*® Turbohaler** (Budesonide/formoterol)	
	Seretide Evohaler® (Fluticasone / Salmeterol 25mcg)	
Combination long acting muscarinic antagonists (LAMA)	***Anoro Ellipta*®** (Umeclidinium/vilanterol 55/22)	Once daily dose. Maintenance bronchodilator treatment to relieve symptoms in adult patients with chronic obstructive pulmonary disease (COPD)

and long acting β-agonists (LABA)	***Duaklir Genuair*** ® (aclidinium/formoterol 340/12)	
	Ultibro Breezhaler®	
Leukotriene receptor antagonists		
Leukotriene receptor antagonists	**Montelukast** **Zafirlukas**	NICE guidance says consider a trial of monteleukast for patients aged 5yrs and above if uncontrolled on low dose ICS (4-8 week trial) Included for add-on therapy according to BTS & SIGN guidelines for the management of chronic asthma as an alternative to increasing ICS dose if some benefit from a LABA trial. (BNF) and BTS/SIGN 2008 revised 2014
Antihistamines		
Non-sedating antihistamines	**Loratadine** **Cetirizine and levocetirizine** **Desloratadine** **Acrivastine** **Fexofenadine** **Mizolastine**	Loratadine is first line on basis of low rate of motor impairment and cost-effectiveness. Loratadine is available OTC. Cetirizine is second line as more likely to impair motor function than Loratadine. Cetirizine is available OTC. As an option if first- and second-line choices are not tolerated or contra indicated.
Sedating antihistamines	**Chlorphenamine** **Cyclizine**	Used for pruritus Chlorphenamine is available OTC.
Adrenaline	**Adrenaline solution for injection in prefilled pen (*Emerade*®)**	• Emerade®has an 18 months shelf life. • 300mcg device has a longer needle than Epipen®. The 150mcg and 300mcg devices are suitable for patients to self-administer. The 500mcg device should only be used by health professionals although generally most practices use vials to administer doses of 500mcg. The extended shelf life is a significant advantage as most patients replace their device when it expires rather than because it has been used.

		Approved PAMM Feb 16
Respiratory stimulants (analeptic)		
Doxapram HCl		
Mucolytics		
Carbocisteine	Do not routinely use to prevent exacerbations. Carbocisteine can be considered in patients with COPD with copious of tenacious sputum. Trial carbocisteine 750mg tds for 4 weeks and stop if ineffective. If effective reduce to bd. Dose: initially 2.25g daily in divided doses, then 1.5g daily in divided doses as condition improves. Acetylcysteine is unlicensed in the UK and for specialist prescribing only. Red drug classification **Erdocysteine is non-formulary**	

Chapter 4: Central nervous system		
Therapeutic Area	**Formulary Choices**	**Rationale for decision / comments**
Hypnotics and anxiolytics Patients should be advised to adopt better sleep hygiene and other lifestyle changes, where appropriate. A leaflet advising on sleep hygiene measures is available on CCG website. Initial prescriptions for hypnotics should be limited to 7-14 days supply and not transferred to repeat without re-assessment of the patient. Tolerance can develop within 3 to 14 days of continuous use and long term efficacy is not assured. Patients who do not benefit from a first Z-drug are unlikely to benefit from another. Zolpidem has a half life of 2.5 hours, zopiclone 3.5-6.5 hours. Different rules may apply to patients cared for by Somerset Partnership NHS Foundation Trust. Diazepam may be considered as an alternative especially when using as a benzodiazepine withdrawal therapy. On March 2nd 2015 a new law was introduced affecting the use of certain medications when driving. It's illegal in England and Wales to drive with legal drugs in your body if it impairs your driving. even if taken as prescribed by a healthcare professional. This applies (amongst others) to the benzodiazepines: clonazepam, diazepam, flunitrazepam, lorazepam,oxazepam, temazepam. See here for more If patient is suffering insomnia as a result of depression, mirtazapine may be a suggested alternative.		
Hypnotics First line	**Zolpidem** **Zopiclone** **Diazepam**	MHRA warned in May 2014 of the risk of morning drowsiness and reduced driving ability with zolpidem. Link
Melatonin Second line	**As Circadin® MR**	Circadin® is indicated as monotherapy for the short-term treatment (up to 13 weeks) of primary insomnia characterised by poor quality of sleep in patients who are aged 55 or over. Circadin may be of benefit to elderly patients at risk of falling, or to patients who drive and are susceptible to next-day drowsiness of z-drugs and benzodiazepines. It is also approved for use off label in patients with Parkinson's disease related insomnia (PAMM Jan 16) and for hemicrania continua (PAMM Jan 16) where the specialist has stabilised the patient on an effective and tolerated dose

Temazepam Third line	**Temazpeam**	Treatment should be limited to lowest dose for the shortest period of time.
Anxiolytics	**Diazepam**	Treatment should be limited to lowest dose for the shortest period of time.
Drugs used in psychoses and related disorders **Related guidance: NICE CG 178 (February 2014) Psychosis and schizophrenia in adults: treatment and management**		
Antipsychotics	Antipsychotics are usually initiated within secondary care, following Somerset Partnership guidelines. Prescribing responsibility may then be transferred to primary care in accordance with a <=”” a=”” style="box-sizing: border-box; color: rgb(0, 114, 198); text-decoration: none;">Shared Care Agreement. All antipsychotics (except risperidone for short-term, <6 weeks, use – see below) are **unlicensed** for use in dementia and should only be used when a person is a risk to themselves and others and all other methods have been tried. Prescribers are reminded that **all** antipsychotics are associated with an increased risk of serious adverse reactions in elderly patients with dementia, (mortality, stroke, TIA and possibly cognition). The choice of antipsychotic medication should be made by the service user and healthcare professional together, taking into account the views of the carer if the service user agrees. Provide information and discuss the likely benefits and possible side effects of each drug, including: • metabolic (including weight gain and diabetes) • extrapyramidal (including akathisia, dyskinesia and dystonia) • cardiovascular (including prolonging the QT interval) • hormonal (including increasing plasma prolactin) • other (including unpleasant subjective experiences).	
	Risperidone	Risperidone is licensed for the short-term treatment, up to six weeks, of **persistent aggression** in patients with moderate to severe Alzheimer’s dementia unresponsive to non pharmacological approaches **and** when there is a risk of harm to self or others. **NB Six-week restriction does not apply where risperidone is being prescribed to treat acute or chronic psychoses or mania**

	Risperidone long acting injection	Two weekly injection as part of a shared-care arrangement.
	Paliperidone long acting injection ▼	Maintenance in schizophrenia in patients previously responsive to paliperidone or risperidone in accordance with the shared care guidelines. Suitable for patients who require antipsychotic medication and can be given as a long acting injection for those patients that have not tolerated other typical depot medications because of EPSE. Paliperidone is an active metabolite of risperidone.
	Olanzapine	
	Aripiprazole	Aripiprazole is recommended as an option for the treatment of schizophrenia in people aged 15 to 17 years who are intolerant of risperidone, or where risperidone is contraindicated, or whose schizophrenia has not been adequately controlled with risperidone. Generic aripiprazole is not licensed for bipolar disease. Use branded Abilify®.
	Quetiapine	Where quetiapine is prescribed, the standard release formulation is preferred for long term use on cost grounds (approx. 15 x price difference). This approach is supported by Somerset Partnership NHS Foundation Trust Mental Health Directorate.
Antimanic drugs		
Bipolar Disorder	**Lithium carbonate**	**Preparations vary widely in bioavailability:** *Lithium **must** be prescribed by brand for safety reasons* **NPSA 'Safer Lithium Therapy' guidance**
Antidepressants		
Selective serotonin re-uptake inhibitors (SSRI)	SSRIs are known to increase risk of GI bleeds especially if co-prescribed with NSAIDs and in the very elderly. Prescribers are reminded of the risk of serotonin syndrome with SSRI when combined with other antidepressants, triptans, and opioids including tramadol. The long half-life of fluoxetine is a benefit on withdrawal, but a drawback when switching drugs, e.g. to a TCA. In elderly or with reduced hepatic function maximum dose of citalopam is 20mg and maximum dose of escitalopram is 10mg. Hyponatraemia (usually in the elderly and possibly due to inappropriate secretion of antidiuretic hormone) has been associated with all types of antidepressants; however, it has been reported more frequently with SSRIs than with other antidepressants. Hyponatraemia should be considered in all patients who develop drowsiness, confusion, or convulsions while taking an antidepressant	
	Fluoxetine **Sertraline** **Citalopram** **Escitalopram** **Paroxetine**	**Sertraline is first line treatment for social anxiety disorder as per NICE CG159**

Tricyclic and related antidepressants	Should be used with caution in patients with cardiovascular diseas because of the risk of arrhythmias. Patients with concomitant conditions such as hyperthyroidism and phaeochromocytoma should be treated with care. Care is also needed in patients with epilepsy and diabetes. Tricyclic antidepressant drugs have antimuscarinic activity, and therefore caution is needed in patients with prostatic hypertrophy, chronic constipation, increased intra-ocular pressure, urinary retention, or those with a susceptibility to angle-closure glaucoma. Tricyclic and related antidepressant drugs should be used with caution in patients with a significant risk of suicide, or a history of psychosis or bipolar disorder, because antidepressant therapy may aggravate these conditions; treatment should be stopped if the patient enters a manic phase. Elderly patients are particularly susceptible to many of the side-effects of tricyclic antidepressants; low initial doses should be used, with close monitoring, particularly for psychiatric and cardiac side-effects	
	Lofepramine **Amitriptiline** **Mirtazapine** **Dosulepin** **Doxepin** **Mianserin** **Trazodone**	
Other antidepressants	**Agomelatine**	It is a melatonin receptor agonist and a selective serotonin-receptor antagonist; it does not affect the uptake of serotonin, noradrenaline, or dopamine
	Duloxetine	Inhibits the re-uptake of both serotonin and noradrenaline and is licensed to treat major depressive disorder.
	Mirtazapine,	Presynaptic α_2 antagonist, increases central noradrenergic and serotonergic neurotransmission. It has few antimuscarinic effects, but causes sedation during initial treatment
	Venlafaxine	It is a serotonin and noradrenaline re-uptake inhibitor; it lacks the sedative and antimuscarinic effects of the tricyclic antidepressants. Treatment with venlafaxine is associated with a higher risk of withdrawal effects compared with other antidepressants
CNS stimulants and drugs used for attention defecit hyperactivity disorder		
Treatment of ADHD	**Methylphenidate** **Atomoxetine** **Dexamfetamine** **Lisdexamfetamine**	
Drugs used in nausea and vertigo		

Antihistamines	**Cinnarizine** **Cyclizine** **Promethazine** **Promethazine**	They are effective against **nausea** and **vomiting** resulting from many underlying conditions. There is no evidence that any one antihistamine is superior to another but their duration of action and incidence of adverse effects (drowsiness and antimuscarinic effects) differ
Phenothiazines	They are dopamine antagonists acting centrally by blocking the chemoreceptor trigger zone. Severe dystonic reactions sometimes occur with phenothiazines. Some phenothiazines are available as rectal suppositories, which can be useful in patients with persistent vomiting or with severe nausea.	
	Perphenazine **Trifluoroperazine** **Chlorpromazine** **Prochlorperazine**	Prochlorperazine, perphenazine, and trifluoperazine are less sedating than chlorpromazine. Prochlorperazine can also be administered as a buccal tablet.
Metoclopramide	Metoclopramide acts directly on the gastro-intestinal tract and it may be superior to the phenothiazines for emesis associated with gastroduodenal, hepatic, and biliary disease. As with the phenothiazines, metoclopramide can induce acute dystonic reactions involving facial and skeletal muscle spasms and oculogyric crises. These dystonic effects are more common in the young (especially girls and young women) and the very old. Injection of an antiparkinsonian drug such as procyclidine will abort dystonic attacks. **MHRA/CHM advice** **Metoclopramide: risk of neurological adverse effects—restricted dose and duration of use (August 2013)** The risk of neurological effects such as extrapyramidal disorders and tardive dyskinesia outweigh the benefits in long-term or high-dose treatment. To help minimise the risk of potentially serious neurological adverse effects, the following restrictions have been made: In adults over 18 years, metoclopramide should only be used for prevention of postoperative nausea and vomiting, radiotherapy-induced nausea and vomiting, delayed (but not acute) chemotherapy-induced nausea and vomiting, and symptomatic treatment of nausea and vomiting, including that associated with acute migraine; Metoclopramide should only be prescribed for short-term use (up to 5 days); Usual dose is 10 mg, repeated up to 3 times daily; max. daily dose is 500 micrograms/kg; Intravenous doses should be administered as a slow bolus over at least 3 minutes.	
Domperidone	Domperidone acts at the chemoreceptor trigger zone; it is licensed only for the relief of nausea and vomiting. It has the advantage over metoclopramide and the phenothiazines of being less likely to cause central effects such as sedation and dystonic reactions because it does not readily cross the blood-brain barrier **MHRA/CHM advice** **Domperidone: risk of cardiac side-effects—restricted indication, new contra-indications, reduced dose and duration of use** As domperidone is associated with a small increased risk of serious cardiac side-effects, the following restrictions have been made:	

	Domperidone should only be used for the relief of the symptoms of nausea and vomiting; Domperidone should be used at the lowest effective dose for the shortest possible duration (**max. treatment duration should not normally exceed 1 week**); Domperidone is contra-indicated for use in conditions where cardiac conduction is, or could be impaired, or where there is underlying cardiac disease, when administered concomitantly with drugs that prolong the QT interval or potent CYP3A4 inhibitors, and in severe hepatic impairment; The recommended dose in adults and adolescents over 12 years and over 35 kg is 10 mg up to 3 times daily.	
Granisetron Ondansetron palonosetron	$5HT_3$ antagonists which block $5HT_3$ receptors in the gastro-intestinal tract and in the CNS. Granisetron and ondansetron are of value in the management of nausea and vomiting in patients receiving cytotoxics and in postoperative nausea and vomiting. Palonosetron is licensed for prevention of nausea and vomiting associated with moderately or highly emetogenic cytotoxic chemotherapy.	
Dexamethasone	has antiemetic effects and it is used in vomiting associated with cancer chemotherapy. It can be used alone or with metoclopramide, prochlorperazine, lorazepam, or a $5HT_3$-receptor antagonist	
Betahistine	Analogue of histamine and is claimed to reduce endolymphatic pressure by improving the microcirculation. Betahistine is licensed for vertigo, tinnitus, and hearing loss associated with Ménière's disease	
Analgesics:		
Avoid **soluble formulations** of Paracetamol and Co-Codamol because of high sodium content (the equivalent of up to 9g of salt per day at full dose) which may contribute to or exacerbate hypertension or heart failure. **Medication Overuse Headache - All medications for treating headache can cause MOH in patients with a pre-existing primary headache disorder, even if taking medicines for pain other than headache. Mean onest 1.7 years (triptans) to 4.8 years (analgesics)**		
Non-opioid analgesics	**Paracetamol Aspirin**	First choice drug in acute and chronic pain. If treatment is not effective check that adequate dose is being used (i.e. 1g QDS) before adding other options. Available OTC. Paracetamol may be considered an option for treating agitation in people with dementia where pain may be a factor. Husebo *et al.* (2011) Br Med J **343**: d4065; Husebo, Ballard, & Aarsland (2011) Int J Ger Psych **26**: 1012-1018.
Weak opioid analgesics	**Codeine Dihydrocodeine**	240mg codeine **equivalent to Morphine 30mg** Note that around 10% of the caucasian population lack the enzyme to metabolize Codeine so derive little benefit from it. Prescribing Paracetamol and Codeine separately enables more appropriate dose titration and enables patients to take more control of their own pain management.
Opioids	**Tramadol**	Tramadol may be considered as an alternative to Codeine where its efficacy or tolerability is poor. MHRA advise short-term or intermittent treatment; caution where history of addiction or seizure. produces analgesia by two mechanisms: an opioid effect and an enhancement of serotonergic and adrenergic pathways. It has fewer of the typical opioid side-effects (notably, less respiratory depression, less constipation and less addiction potential); psychiatric reactions have been reported
	Morphine Buprenorphine	

	Diamorphine **Oxycodone**	
	Alfentanil **Fentanyl** **Remifentanil**	Used by injection for intra-operative analgesia
	Pethidine	Produces prompt but short-lasting analgesia; it is less constipating than morphine, but even in high doses is a less potent analgesic
Neuropathic pain		
NICE recommendation for the pharmacological management of neuropathic pain depends on diagnosed origin of the pain. **There is no need to change existing treatments for people whose neuropathic pain is well controlled** When switching to a new drug, consider overlapping treatments to avoid deterioration in pain control When withdrawing, taper the dose to avoid discontinuation symptoms If pain reduction is still unsatisfactory at maximum doses of first & second line treatments refer patient to a specialist pain and/or condition specific service		
Neuropatic pain`	**Amitriptyline**	
	Gabapentin	
	Pregabalin	
	Duloxetine	
Antimigraine drugs	**Sumatriptan** **zolmitriptan**	
Others	**Propranolol** **Topiramate**	Propranolol is the recommended first line prophylactic therapy for migraine Topiramate is effective for migraine prophylaxis.
Epilepsy		
AED Categorisation Problems related to small differences in bioavailability of different manufacturers products (branded, generic) are of concern for some drugs (most notably phenytoin) but not for some others that have a wider therapeutic index and/or high solubility and permeability. In broad terms, three groups of AEDs are identified regarding concerns of the potential risk related to switching between products **MHRA/CHM advice** **Antiepileptic drugs: new advice on switching between different manufacturers' products for a particular drug (November 2013)** **NICE CG137** recommends use of controlled release preparations when prescribing Carbamazepine		

Category 1	**Phenytoin** **Carbamazepine** **Phenobarbital** **primidone**	For these drugs, doctors are advised to ensure that their patient is maintained on a specific manufacturer's product
Category 2	**Valproate** **Lamotrigine** **Retigabine** **Clobazam** **Clonazepam** **oxcarbazepine,** **eslicarbazepine** **Topiramate**	For these drugs the need for continued supply of a particular manufacturer's product should be based on clinical judgement and consultation with patien carer taking into account factors such as seizure frequency and treatment history.t
Category 3	**Levetiracetam** **Tiagabine** **Gabapentin** **Pregabalin** **Ethosuximide** **vigabatrin**	For these drugs it is usually unnecessary to ensure that patients are maintained on a specific manufacturer's product unless there are specific concerns.
Drugs used in status epilepticus	**Diazepam** **Fosphenytoin** **Lorazepam** **Midazolam** **Phenobarbital** **Phenytoin**	If, after initial treatment with benzodiazepines, seizures recur or fail to respond 25 minutes after onset, phenytoin sodium, fosphenytoin, or phenobarbital sodium should be used. If these measures fail to control seizures 45 minutes after onset, anaesthesia with thiopental, midazolam or in adults, a non-barbiturate anaesthetic such as propofol should be instituted with full intensive care support.
Drugs for dementia **Related guidance: NICE Technology Appraisal TA217 (2011): Donepezil, galantamine, rivastigmine and memantine for Alzheimer's disease**		
Acetylcholinesterase inhibitors	**Donepezil** **Galantamine** **Rivastigmine**	The acetylcholinesterase (AChE) inhibitors: Donepezil, Galantamine and Rivastigmine are recommended as options for mild to moderate Alzheimer's disease. Avoid anticholinergic (antimuscarinic) drugs with acetylcholinesterase inhibitors which have the potential to reverse their effects
NMDA-receptor antagonist	**Memantamine**	is recommended as an option for people with; • Moderate Alzheimer's disease who are intolerant or, or have a contraindication to AChE inhibitors, or • Severe Alzheimer's disease.

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 5: Infections		
Antibacterial drugs		
Penicillins	**Phenoxymethyl-penicillin (Penicillin V)** **Flucloxacillin** **Amoxicillin** **Co-amoxiclav** **Temocillin** **Ampicillin**	Co-amoxiclav consists of amoxicillin with the beta-lactamase inhibitor clavulanic acid. Clavulanic acid itself has no significant antibacterial activity but, by inactivating beta-lactamases, it makes the combination active against beta-lactamase-producing bacteria that are resistant to amoxicillin. These include resistant strains of Staph. aureus, E. coli, and H. influenzae
	Piperacillin with tazobactam	Piperacillin is only available in combination with the beta-lactamase inhibitor tazobactam. broad spectrum of activity against a range of Gram-positive and Gram-negative bacteria, and anaerobes. It is not active against MRSA. Used in the treatment of septicaemia, hospital-acquired pneumonia, and complicated infections involving the urinary tract, skin and soft tissues.
	Pivmecillinam	
Cephalosporins, carbapenems and others		
The cephalosporins are broad-spectrum antibiotics which are used for the treatment of septicaemia, pneumonia, meningitis, biliary-tract infections, peritonitis, and urinary-tract infections. The pharmacology of the cephalosporins is similar to that of the penicillins, excretion being principally renal		
Cephalosporins	**Cefuroxime**	is a 'second generation' cephalosporin that is less susceptible than the earlier cephalosporins to inactivation by beta-lactamases. It is, therefore, active against certain bacteria which are resistant to the other drugs and has greater activity against *Haemophilus influenzae*
	Cefotaxime **Ceftazidime** **Ceftriaxone**	'third generation' cephalosporins with greater activity than the 'second generation' against certain Gram-negative bacteria. However, they are less active than cefuroxime against Gram-positive bacteria, most notably Staphylococcus aureus.
	Ceftaroline	is a 'fifth generation' cephalosporin with bactericidal activity similar to cefotaxime; however, ceftaroline has an extended spectrum of activity against Gram-positive bacteria that includes meticillin-resistant Staphylococcus aureus and multi-drug resistant Streptococcus pneumonia
Carbapenems and aztreonam	**Imipenem** **Meropenem**	

	Aztreonam	
Tetracyclines	Tetracyclines may increase muscle weakness in patients with myasthenia gravis and exacerbate systemic lupus erythematosus. Antacids, and aluminium, calcium, iron, magnesium and zinc salts decrease the absorption of tetracyclines; milk also reduces the absorption of demeclocycline, oxytetracycline, and tetracycline With the exception of doxycycline and minocycline, the tetracyclines may exacerbate renal failure and should not be given to patients with renal impairment	
	Tetracycline **Demeclocycline HCl** **Doxycycline** **Lymeccycline** **Minocycline** **Oxytetracycline** **Tigecycline**	Tigecycline is a glycylcycline antibacterial structurally related to the tetracyclines. It is active against Gram-positive and Gram-negative bacteria, including tetracycline-resistant organisms, and some anaerobes. It is also active against meticillin-resistant Staphylococcus aureus and vancomycin-resistant enterococci.
Aminoglycosides	**Amikacin** **Gentamicin** **Neomycin** **Streptomycin** **Tobramycin**	All are bactericidal and active against some Gram-positive and many Gram-negative organisms. Streptomycin is active against *Mycobacterium tuberculosis* and is now almost entirely reserved for tuberculosis. The important side-effects of the aminoglycosides are nephrotoxicity and irreversible ototoxicity (including vestibular and auditory damage). Rash occurs commonly with streptomycin, but less frequently with the other aminoglycosides
Macrolides	**Azithromycin** **Clarithromycin** **Erythromycin** **Telithromycin**	Erythromycin and Clarithromycin are known inhibitors of cytochrome P450 enzyme CYP3A4. Prescribers should be aware of the potential for drug interactions with other medicines.
Clindamycin	Clindamycin is recommended for staphylococcal joint and bone infections such as osteomyelitis and intra-abdominal sepsis.	
Some other antibacterials	**Chloramphenicol**	Potent broad-spectrum antibiotic. It is associated with serious haematological side-effects when given systemically. Commonly used for eye infections.
	Fosfomycin	Phosphonic acid antibacterial, is active against a range of Gram-positive and Gram-negative bacteria including *Staphylococcus aureus* and Enterobacteriaceae. It is licensed intravenously for the treatment of acute osteomyelitis, complicated urinary-tract infections, hospital-acquired lower respiratory-tract infections
	Fusidic acid	Narrow-spectrum antibiotic. The only indication for their use is in infections caused by penicillin-resistant staphylococci.
	glycopeptides	**Vancomycin**, **Teicoplanin**, and **Telavancin** have bactericidal activity against aerobic and

		anaerobic Gram-positive bacteria including multi-resistant staphylococci. However, there are reports of *Staphylococcus aureus* with reduced susceptibility to glycopeptides. There are increasing reports of glycopeptide-resistant enterococci. Vancomycin has a long duration of action and can therefore be given every 12 hours. Teicoplanin is similar to vancomycin, but has a significantly longer duration of action, allowing once daily administration after the loading dose. Teicoplanin is associated with a lower incidence of nephrotoxicity than vancomycin. Telavancin may be associated with a higher incidence of nephrotoxicity than vancomycin.
	Daptomycin	Lipopeptide with a spectrum of activity similar to vancomycin but its efficacy against enterococci has not been established. Daptomycin should be reserved for complicated skin and soft-tissue infections caused by resistant Gram-positive bacteria including meticillin-resistant *Staphylococcus aureus* (MRSA). It needs to be given with other antibacterials for mixed infections involving Gram-negative bacteria and some anaerobes
	Linezolid	Haematopoietic disorders have been reported in patients receiving linezolid, particularly the elderly. Close monitoring is recommended in patients who: receive treatment for more than 10–14 days; have pre-existing myelosuppression; are receiving drugs that may have adverse effects on haemoglobin, blood counts, or platelet function; have severe renal impairment.
Sulfonamides and trimethoprim	**Co-trimoxazole** **Trimethoprim**	
Rifampicin	Liver function tests and blood counts in hepatic disorders, alcohol dependence, and on prolonged therapy.	
Metronidazole	Disulfiram-like reaction with alcohol; clinical and laboratory monitoring advised if treatment exceeds 10 days.	
Quinolones	**Nalidixic acid** **Norfloxacin** **Ciprofloxacin** **Ofloxacin** **Levofloxacin** **Moxifloxacin**	Quinolones should be used with caution in patients with a history of epilepsy or conditions that predispose to seizures, in G6PD deficiency. Exposure to excessive sunlight should be avoided (discontinue if photosensitivity occurs). Quinolones can prolong the QT interval. Moxifloxacin is contra-indicated in patients with risk factors for QT interval prolongation Quinolones may induce **convulsions** in patients with or without a history of convulsions; taking NSAIDs at the same time may also induce them. Tendon damage.

Urinary tract infections (UTI)	**Nitrofurantoin**	
Antifungal drugs		
Antifungals	**Fluconazole** **Itraconazole** **Terbinafine**	Transient or permanent hearing loss has been reported with itraconazole.
Antiviral drugs		
Herpes virus infections	**Aciclovir** **Valaciclovi**	Valaciclovir is included for genital herpes for second line use when Aciclovir is not appropriate.

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 6 Endocrine system		
Related guidance: NICE Clinical Guideline CG87 (2009): Type 2 diabetes The VADT, ACCORD and ADVANCE trials show that tight control of blood glucose in long standing Type 2 diabetics (reducing HbA1c to below 7%) may be harmful. A measure of the total glycosylated (or glycated) haemoglobin (HbA1) or a specific fraction (HbA1c) provides a good indication of glycaemic control over the previous 2–3 months. Overall it is ideal to aim for an HbA1c (glycosylated haemoglobin) concentration of 48–59 mmol/mol or less (reference range 20–42 mmol/mol) but this cannot always be achieved and for those using insulin there is a significantly increased risk of disabling hypoglycaemia; in those at risk of arterial disease, the aim should be to maintain the HbA1c concentration at 48 mmol/mol or less. HbA1c should be measured every 3–6 months. Measurement of HbA_{1c} HbA_{1c} values are expressed in *mmol of glycosylated haemoglobin per mol of haemoglobin (mmol/mol),* a standardised unit specific for HbA_{1c} created by the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). HbA_{1c} values were previously aligned to the assay used in the Diabetes Control and Complications Trial (DCCT) and expressed as a percentage.		
Insulins		
Short Acting	**Insulin aspart** **Insulin lispro** **Soluble insulin** **Insulin glulisine**	
Intermediate- and long-acting insulins	**Biphasic insulin aspart** **Biphasic Insulin lispro** **Isophane insulin** **Biphasic isophaneinsulin** **Insulin glargine** **Insulin detemir** **Degludec**	
Drugs used in diabetes		
Biguanides	**Metformin**	The only available biguanide; not interchangeable with sulfonylureas. It exerts its effect mainly by decreasing gluconeogenesis and by increasing peripheral utilisation of glucose. Euglicemic agent. Does not usually cause hypoglycaemia or lactic acidosis.
Sulfonylureas	**Glibenclamide**	Long-acting sulfonylurea, is associated with a greater risk of hypoglycaemia, for this reason it should be avoided in the elderly
	Gliclazide	

	Tobutamide	
	Glimepiride	
Other antidiabetic drugs	**Acarbose**	Inhibitor of intestinal alpha glucosidases, delays the digestion and absorption of starch and sucrose; it has a small but significant effect in lowering blood glucose
Insulin secretion stimulators	**Nateglinide** **Repaglinide**	
Pioglitazone	MHRA/CHM advice: Pioglitazone cardiovascular safety (December 2007 and January 2011	
DPP-4 inhibitors (Gliptins)	**Sitagliptin** **Saxagliptin** **Linagliptin** **Vildagliptin** **Alogliptin**	Dosage needs to be adjusted in case of renal impairment
Sodium-glucose cotransporter-2 (SGLT-2) inhibitor	**Dapagliflozin**	Not recommended with concurrent pioglitazone or eGFR <60ml/min/1.73m2
	Canagliflozin **Empagliflozin**	
GLP-1 mimetic (Glucagon-like peptide-1 analogue)	They bind and activate the GLP-1 (glucagon-like peptide-1) receptor to increase insulin secretion, suppress glucagon secretion, and slow gastric emptying. Treatment with exenatide, liraglutide, and lixisenatide is associated with the prevention of weight gain and possible promotion of weight loss which can be beneficial in overweight patients.	
	Lixisenatide **Exenatide** **Liraglutide**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Thyroid and antithyroid drugs		
Thyroid hormones	**Levothyroxine (thyroxine)** **Liothyronine**	Thyroxine is the treatment of choice for *maintenance* therapy. Liothyronine has similar action to levothyroxine but is more rapidly metabolised and has a more rapid effect.
Anti-thyroid hormones	**Carbimazole** **Propylthiouracil**	Propylthiouracil is included only for patients intolerant to Carbimazole.
Corticosteroids		
Glucocorticoid therapy	**Prednisolone**	Enteric-coated prednisolone has slower onset of action, less consistent blood levels and no proven evidence of GI protective effect.
	Betamethasone **Dexamethasone**	Very high glucocorticoid activity in conjunction with insignificant mineralocorticoid activity. This makes them particularly suitable for high-dose therapy in conditions where fluid retention would be a disadvantage.
	Hydrocortisone	The relatively high mineralocorticoid activity and the resulting fluid retention, makes it unsuitable for disease suppression on a long-term basis
Hypothalamic and anterior pituitary hormones and anti-oestrogens		
Anti-oestrogens	**Clomifene** **Tamoxifen**	
Posterior pituitary hormones	**Vasopressin (antidiuretic hormone, ADH)** **Desmopressin**	
Drugs affecting the bone metabolism		
Prevention (primary and/or secondary) of osteoporosis in postmenopausal women	**Alendronic acid** **Risedronate** **Ibandronate** **Denosumab** **Raloxifene** **Strontium ranelate**	
Calcium and vitamin D_3 supplement	**1000mg/880IU** **600/800IU**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 7: Obstetrics, gynaecology, and urinary-tract disorders		
Treatment of vaginal and vulval conditions		
Preparations for vaginal atrophy	**Topical Estradiol**	Topical oestrogens should be used in the lowest effective amount to minimize systemic absorption. Patients should be reviewed at least annually to re-assess the need for continued treatment and to monitor for symptoms of endometrial hyperplasia or carcinoma in women with a uterus.
Vaginal and vulval infections	**Fluconazole (oral)** **Clotrimazole (intra-vaginal and/ortopical)**	
Contraceptives		
Progestogen-only contraceptives	All progestogen-only contraceptives (including those given by injection) are suitable for use as an alternative to combined hormonal contraceptives before major elective surgery, before all surgery to the legs, or before surgery which involves prolonged immobilisation of a lower limb.	
	Desogestrel **Levonorgestrel** **Norethisterone**	The progestogen-only intra-uterine system, ***Mirena***®, releases **levonorgestrel** directly into the uterine cavity. It is licensed for use as a contraceptive, for the treatment of primary menorrhagia and for the prevention of endometrial hyperplasia during oestrogen replacement therapy
Drugs for genito-urinary disorders		
Drugs for urinary retention **Related guidance: NICE Clincal Guideline CG97 (2010): Lower urinary tract symptoms**		
Alpha-blockers	**Doxazosin** **Tamsulosin** **Alfuzosin** **Indoramin** **Prazosin** **Terazosin**	
5α-reductase inhibitors blocker	**Dutasteride** **Finasteride**	Inhibition of the enzime that metabolises testosterone into the more potent androgen, dihydrotestosterone. This inhibition of testosterone metabolism leads to reduction in prostate size, with improvement in urinary flow rate and in obstructive symptoms. Dutasteride and finasteride are alternatives to α-blockers
Urinary incontinence		
Antimuscarinic drugs	**Oxybutynin.** **Tolterodine** **Flavoxate**	They reduce symptoms of urgency and urge incontinence and increase bladder capacity Solifenacin and trospium are newer antimuscarinic drugs licensed for urinary frequency, urgency, and incontinence

	Darifenacin **Fesoterodine** **Propiverine** **Solifenacin** **Trospium**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 8 Nutrition and blood		
Anaemias and some other blood disorders		
Iron deficiency	**Ferrous fumarate** **Ferrous sulphate** **Iron sucrose (IV)**	210mg Ferrous fumarate provides 68mg elemental iron, usual dose **210mg tds**. 322mg Ferrous fumarate provides 100mg elemental iron, usual dose **322mg bd** **Ferrous Fumarate** should be prescribed in place of the **Ferrous Sulphate** as it provides equivalent at lower cost. For reference 200mg Ferrous sulphate tablets provide 65mg elemental iron.
Megaloblastic anaemia	**Folic acid** **Hydroxocobalamin**	
Fluids and electrolytes		
Potassium Salts	**Potassium chloride**	
Sodium salts	**Sodium Cl**	
Minerals		
Calcium supplements	**Calcium carbonate**	
Vitamins		
Vitamin D	**Colecalciferol 800IU**	
Vitamin K_1	**Phytomenadione**	For use in the management of haemorrhage due to Warfarin

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 9 Musculoskeletal and joint diseases		
Drugs used in rheumatic diseases and gout **Related guidance: CG177 Osteoarthritis: Care and management in adults Feb 2014**		
NICE recommends cytoprotection with PPIs for patients who require systemic NSAIDs. Recommended PPIs are: Lansoprazole 15mg; Omeprazole 20mg or Pantoprazole 20mg. Risk of GI bleeds is higher for slow release formulations. **Note** that all NSAIDs should be prescribed at the minimum effective dose for the minimum period in order to limit cardiovascular, renal and GI toxicity.		
Non-steroidal anti-inflammatory drugs (NSAIDs)	**Ibuprofen** **Dexibuprofen** **Naproxen** **Flurbiprofen** **Ketoprofen** **Aspirin** **Dexketoprofen** **Diclofenac** **Aceclofenac** **Etodolac** **Indometacin** **Mefenamic Acid** **Meloxicam** **Nabumetone.** **Phenylbutazone** **Piroxicam** **Sulindac** **Tenoxicam** **Ketorolac**	
COX-2 selective NSAIDs	**Etoricoxib** **Celecoxib**	
Rubefacients and **topical NSAIDs**	**Ibuprofen Topical** **Piroxicam Topical** **Capsaicin**	NICE advises that Paracetamol and/or Topical NSAIDs should be considered AHEAD of oral NSAIDs for OSTEOARTHRITIS Topical NSAIDs should be considered for use in addition to core treatment for **knee** or **hand** inflammation.
Gout	Guidelines on management of gout available from The British Society for Rheumatology and British Health Professionals in Rheumatology: http://rheumatology.oxfordjournals.org/cgi/reprint/kem056av1	
Acute attacks	**Naproxen** **Colchicine**	Colchicine can be an effective alternative to NSAIDs, but has a slower onset of action. To reduce risk of diarrhoea it should be used in doses of 500mcg bd to qds.
Long term Control	**Allopurinol** **Febuxostat** **sulfinpyrazone**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 10: Eye		
Anti-infective eye preparations		
Antibacterials (topical/drops)	**Chloramphenicol** **Ciprofloxacin** **Levofloxacin** **Moxifloxacin** **Ofloxacin** **Gentamicin** **Tobramycin** **Propamidine** **Fusidic acid**	Chloramphenicol drops and ointment are both available OTC
Antivirals	**Aciclovir**	
Corticosteroids and other anti-inflammatory preparations		
Topical corticosteroids	**Betamethasone** **Dexamethasone** **Fluorometholone** **Loteprednol Etabonate** **Prednisolone** **Rimexolone**	
Antihistamines	**Antazoline** **Azelastine** **Ketotifen** **Olopatadine**	
Anti-inflammatory preparations	**Sodium Cromoglicate** **Nedocromil Sodium** **Lodoxamide** **Diclofenac** **Bromfenac**	
Mydriatics and cycloplegics		
Antimuscarinics dilate the pupil and paralyse the ciliary muscle; they vary in potency and duration of action. Short-acting, relatively weak mydriatics (4–6 hours), facilitate the examination of the fundus of the eye. Long acting ones act to up to 24 hours or 7 days		
Antimuscarinic	**Atropine** **Cyclopentolate** **Homatropine** **Tropicamide**	

Sympathomimetics	**Phenylephrine (with or without tropicamide)**	
Treatment of glaucoma		
Where a prostaglandin analogue is indicated for reducing IOP, Latanoprost is the recommended first line agent on grounds of cost and ocular tolerability.		
Beta-Blockers	**Betaxolol** **Carteolol Levobunolol** **Timolol**	Beta-blockers, even those with apparent cardioselectivity, should not be used in patients with asthma or a history of obstructive airways disease, unless no alternative treatment is available. In such cases the risk of inducing bronchospasm should be appreciated and appropriate precautions taken.
Prostaglandin Analogues	**Latanoprost** **Tafluprost** **Travoprost** **Prostamide** **Bimatoprost**	Before initiating treatment, patients should be warned of a possible change in eye colour as an increase in the brown pigment in the iris can occur, which may be permanent; particular care is required in those with mixed coloured irides and those receiving treatment to one eye only
Sympathomimetics	**Brimonidine**	selective α_2 agonist
Local Anaesthetics	**Lidocaine (With Fluorescein For Tonometry)** **Oxybuprocaine** **Proxymetacaine Tetracaine**	
Miscellaneous ophthalmic preparations		
Tear deficiency, ocular lubricants, and astringents	**Hypromellose** **Carbomers** **Polyvinyl alcohol** **Sodium hyaluronate** **Sodium chloride 0.9% or 5%**	**Sodium chloride 5%** eye drops are used for the short-term treatment of corneal oedema.
Ocular diagnostic and peri-operative preparations		
Miscellaneous	**Fluorescein 1% or 2%**	
Ocular peri-operative drugs	**Cefuroxime/Vancomycin** **Diclofenac** **Flurbiprofen** **Ketorolac** **Nepafenac**	Drugs used to prepare the eye for surgery, drugs that are injected into the anterior chamber at the time of surgery and those used after eye surgery. **Cefuroximeor vancomycin are** administered by intra-ocular injection into the anterior chamber of the eye (intracameral use). Non-steroidal anti-inflammatory eye drops are used for the prophylaxis and treatment of inflammation, pain, and other symptoms associated with ocular surgery.

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Chapter 12: Ear, nose, and oropharynx		
Drugs acting on the ear	**Acetic Acid 2%** **Betamethasone With Neomycin** **Dexamethasone** **Chloramphenicol** **Clioquinol** **Clotrimazole** **Framycetin Sulfate** **Gentamicin** **Neomycin**	
Drugs acting on the nose	**Azelastine** **Beclometasone** **Betamethasone** **Budesonide** **Fluticasone** **Mometasone Triamcinolone** **Sodium Cromoglicate** **Ephedrine** **Xylometazoline**	**Decolonisation of nasal MRSA with Mupirocin or Neomycin** For use in decolonisation of nasal MRSA, standard regime is BD nasal application for 5 days. Where there is clinical infection, nasal decolonisation treatment should be undertaken in addition to any systemic treatment given. Please refer to CARE UK Policy
Drugs acting on the oro-pharynx	**Chlorhexidine Mouthwash** **Hydrocortisone Oromucosal Tablets** **Benzydamine Mouthwash And Spray** **Flurbiprofen** **Lidocaine Spray 10%**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
BNF Chapter 13: Dermatological preparations		
Always ensure that sufficient quantities are prescribed: liberal twice daily application to the whole adult body will use at least 500g per week. Total quantity of emollient per week (based on "bd" application) for an adult: Face: 15-30g, Trunk: 400g, Both arms / legs: 100-200g, Both hands: 25-50g, Groins and genitalia: 15-25g, Scalp: 50-100g The more greasy an emollient the more effective it is but this needs to be balanced against cosmetic acceptability and compliance Emollient creams and emulsifying ointment can be used as soap substitutes as well as moisturisers Emollients should be applied by smoothing onto the skin in direction of any hairs (not by rubbing) Regular re-application, especially after washing, with drying by patting not rubbing, will increase the effectiveness of all emollient therapy		
Emollients		
Emollients (non proprietary names)	**Emulsifying Ointment** **Hydrous Ointment** **Liquid and White Soft** **Paraffin Ointment, NPF** **Paraffin, White Soft** **Paraffin, Yellow Soft**	
Topical local anaesthetics and antipruritics		
Miscellaneous	**Calamine** **Crotamiton** **Doxepin Hcl** **Levomenthol** **Topical Anaesthetics** **Topical Antihistamines**	
Topical corticosteroids		
The Finger Tip Unit (FTU) is a useful way of calculating approximate quantities required as follows (1 FTU = 0.5g): Face and neck: 2.5 FTU , Trunk: 7 FTU (front) and 7 FTU (back), One arm: 3 FTU, One hand: 1 FTU, One leg: 6 FTU, One foot: 2 FTU Total quantities of topical steroids required per week based on "bd" application for an adult: Face and neck: 15-30g, Trunk: 100g, Both arms: 50g, both hands: 15-30g, Both legs: 100g, Groins and genitalia: 15-30g.		
Mild	**Hydrocortisone**	**Caution**: Hydrocortisone butyrate is a potent steroid (*Locoid®*)
Moderate	**Clobetasone butyrate 0.05%** **Betamethasone valerate 0.025%** **Fludroxycortide 0.0125%**	
Potent	**Betamethasone valerate 0.1%** **Hydrocortisone butyrate 0.1%** **Mometasone furoate 0.1%**	

	Fluticasone propionate 0.05% **Fluocinolone acetonide 0.025%**	
Very potent	**Clobetasol propionate 0.05%**	
Preparations for eczema and psoriasis		
Vitamin D analogues	**Calcipotriol with or without betamethasone**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
15 Anaesthesia		
General Anaesthesia		
Intravenous anaesthetics	**Etomidate** **Ketamine** **Propofol** **Thiopental Sodium**	
Inhalational anaesthetics	**Desflurane** **Isoflurane** **Sevoflurane**	Volatile liquid anaesthetics can trigger malignant hyperthermia. They can increase cerebrospinal pressure and should be used with caution in those with raised intracranial pressure. They can also cause hepatotoxicity in those sensitised to halogenated anaesthetics
	Nitrous oxide	Used for maintenance of anaesthesia and, in sub-anaesthetic concentrations, for analgesia. For anaesthesia, NO is commonly used in a concentration of 50 to 66% in oxygen. Nitrous oxide is unsatisfactory as a sole anaesthetic owing to lack of potency, but is useful as part of a combination of drugs since it allows a significant reduction in dosage. For analgesia (without loss of consciousness), a mixture of nitrous oxide and oxygen containing 50% of each gas (Entonox®, Equanox®) is used. Nitrous oxide may have a deleterious effect if used in patients with an air-containing closed space since nitrous oxide diffuses into such a space with a resulting increase in pressure. This effect may be dangerous in conditions such as pneumothorax.
Antimuscarinic drugs	**Atropine** **Hyoscine** **Glycopyrronium**	**Atropine** still has an emergency role in the treatment of vagotonic side-effects. hyoscine may cause the central anticholinergic syndrome in some patients, especially the elderly, (excitement, ataxia, hallucinations, behavioural abnormalities, and drowsiness). Glycopirronium is widely used with neostigmine for reversal of non-depolarising neuromuscular blocking drugs
Sedative and analgesic peri-operative drugs		
Benzodiazepines	**Diazepam** **Temazepam** **Lorazepam** **Midazolam**	
Non-opioids analgesics	**Ketorolac** **Parecoxib**	
Opioid analgesics	**Alfentanil** **Fentanyl** **Remifentanil**	In contrast to other opioids which are metabolised in the liver, **remifentanil** undergoes rapid metabolism by non-specific blood and tissue esterases; its short duration of action allows prolonged administration at high dosage, without accumulation, and with little risk of residual postoperative respiratory depression
Other drugs for sedation	**Dexmedetomidine** **Clonidine**	

Therapeutic Area	Formulary Choices	Rationale for decision / comments
Neuromuscular blocking drugs		
Non-depolarising neuromuscular blocking drugs		
Aminosteroid	**Pancuronium** **Rocuronium** **Vecuronium**	Allergic cross-reactivity between neuromuscular blocking drugs has been reported; caution is advised in cases of hypersensitivity to these drugs. Their activity is prolonged in patients with myasthenia gravis and in hypothermia. Non-depolarising neuromuscular blocking drugs should be used with great care in those with other neuromuscular disorders and those with fluid and electrolyte disturbances, as response is unpredictable Benzylisoquinolinium non-depolarising neuromuscular blocking drugs (except cisatracurium) are associated with **histamine release**, which can cause skin flushing, hypotension, tachycardia, bronchospasm, and very rarely anaphylactoid reactions. Most aminosteroid neuromuscular blocking drugs produce minimal histamine release. Drugs with vagolytic activity can counteract any bradycardia that occurs during surgery.
Benzylisoquinolinium group	**Atracurium** **Cisatracurium** **Mivacurium**	
Depolarising neuromuscular blocking drugs	**Suxamethonium**	
Drugs for reversal of neuromuscular blockade		
Anticholinesterases	**Neostigmine** with or w/o **Glycopirronium**	reversal of non-depolarising (competitive) blockade.
Other drugs for reversal of neuromuscular blockade	**Sugammadex**	It is used mainly for rapid reversal of neuromuscular blockade in an emergency
Antagonists for central and respiratory depression		
Miscellaneous	**Flumazenil** **Doxapram** **Naloxone**	
Drugs for malignant hyperthermia		
Miascellaneous	**Dantrolene**	
Local anaesthesia		
Use of vasoconstrictors Local anaesthetics cause dilatation of blood vessels. The addition of a vasoconstrictor such as adrenaline (epinephrine) to the local anaesthetic preparation diminishes local blood flow, slowing the rate of absorption and thereby prolonging the anaesthetic effect. Great care should be taken to avoid inadvertent intravenous administration of a preparation containing adrenaline, and it is not advisable to give adrenaline with a local anaesthetic injection in digits or		

appendages because of the risk of ischaemic necrosis		
Local anasthetics	**Bupivacaine** **Chloroprocaine** **Levobupivacaine** **Lidocaine** **Mepivacaine** **Prilocaine** **Ropivacaine** **Tetracaine**	