





Chapter 2. Cardiovascular System

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Key

	<p>Red drug see GMMMG RAG list</p> <p><i>Click on the symbols to access this list</i></p>
	<p>Amber drug see GMMMG RAG list</p> <p><i>Click on the symbols to access this list</i></p>
	<p>Green drug see GMMMG RAG list</p> <p><i>Click on the symbols to access this list</i></p>
U	<p>If a medicine is unlicensed this should be highlighted in the template as follows</p> <p>Drug name U</p>
	<p>Not Recommended</p>
OTC	<p>Over the Counter</p> <p>In line with NHS England guidance, GM do not routinely support prescribing for conditions which are self-limiting or amenable to self-care. For further details see GM commissioning statement.</p>
Order of Drug Choice	<p>Where there is no preferred 1st line agent provided, the drug choice appears in alphabetical order.</p>

Additional notes for chapter 2

Monitoring of renal function and electrolytes is required for many of drugs covered in this chapter, especially in patients who are on multiple drug therapy. Ensure appropriate monitoring for following drugs or groups of drugs:

Digoxin – monitor for signs of toxicity especially in elderly. NB hypokalaemia can predispose to digitalis toxicity. Caution when used with diuretics.

Potassium-sparing diuretics – monitor for hyperkalaemia and hypovolaemia, especially in people taking other diuretics and/or ACE inhibitors.

Low molecular weight heparins - monitor full blood count and potassium levels regularly.

Remember that some medications require to be titrated to ensure achieving optimal results, especially in heart failure and post-MI patients. Follow specific NICE guidance when optimizing therapy with:

- ACE- inhibitors
- ARBs
- statins
- beta blockers.

BNF chapter	2. Cardiovascular system	
Section	2.1 Positive inotropic drugs	
Subsection	2.1.1. Cardiac glycosides	
	Digoxin Tablets 62.5 micrograms , 125 micrograms , 250 micrograms	NICE CG180: Atrial fibrillation NICE NG106: Heart failure


BNF chapter	2. Cardiovascular system	
Section	2.2 Diuretics	
Do Not Prescribe	Diuretics with potassium	Criterion 2 (see RAG list)
Subsection	2.2.1 Thiazides and related diuretics	
First choice	Indapamide Tablets 2.5mg	NICE CG127: Hypertension
Alternatives	Bendroflumethiazide Tablets 2.5mg, 5mg	
Subsection	2.2.2 Loop diuretics	
First choice	Furosemide Tablets 20mg, 40mg, 500mg	NICE NG148: Acute kidney injury
Alternative	Bumetanide Tablets 1mg, 5mg	
Subsection	2.2.3 Potassium-sparing diuretics	
	Amiloride Tablets 5mg	NICE NG106: Heart failure
Subsection	Aldosterone antagonists	
	Eplerenone Tablets 25mg, 50mg	Gn following specialist initiation NICE NG185: Acute coronary syndromes NICE NG106: Heart failure
	Spironolactone Tablets 25mg, 50mg, 100mg	MHRA DSU: Spironolactone and renin-angiotensin system drugs in heart failure: risk of potentially fatal hyperkalaemia (Feb 2016)

		NICE NG106: Heart failure NICE CG127: Hypertension NICE NG185: Acute coronary syndromes
<p>Additional notes</p> <p>Spironolactone is significantly cheaper than eplerenone; however, there is no data available to compare cost effectiveness in particular group of patients.</p>		
Subsection	2.2.4 Potassium-sparing diuretics with other diuretics	
	<p>Co-amilofruse Tablets 5mg/40mg</p>	Do not use combined preparations first line.

BNF chapter	2. Cardiovascular system	
Section	2.3 Anti-arrhythmic drugs	
Subsection	2.3.2 Drugs for arrhythmias (specialist initiation only)	
Supraventricular & ventricular arrhythmias	Amiodarone (specialist initiation only) Tablets 100mg, 200mg	A shared care protocol in development NICE CG180: Atrial fibrillation
	Amiodarone Injection	R NHS England Items which should not be routinely prescribed in primary care: Guidance for CCGs
	Flecainide (specialist initiation only) Tablets 50mg, 100mg	G_n following specialist initiation NICE CG180: Atrial fibrillation
Supraventricular arrhythmias	Dronedarone (specialist initiation only) Tablets 400mg	G_n following specialist initiation. Regular monitoring required, see SPC MHRA DSU: dronedarone monitoring, Oct 2011 NICE TA197: Atrial fibrillation - dronedarone

BNF chapter	2. Cardiovascular system	
Section	2.4 Beta-adrenoceptor blocking drugs	
First choice dependant on indication	Bisoprolol Tablets 1.25mg, 2.5mg, 3.75mg, 5mg, 7.5mg, 10mg	NICE CG180: Atrial fibrillation NICE NG106: Heart failure NICE CG127: Hypertension NICE CG126: Stable angina NICE NG185: Acute coronary syndromes NICE CG107: Hypertension in pregnancy
	Carvedilol Tablets 3.125mg, 6.25mg, 12.5mg, 25mg	
	Labetalol (pregnancy) Tablets 100mg, 200mg, 400mg	
	Propranolol (non-cardiovascular indications) Tablets 10mg, 40mg, 80mg Modified release capsules 80mg, 160mg	
Alternative	Atenolol Tablets 25mg, 50mg, 100mg	

BNF chapter	2. Cardiovascular system	
Section	2.5 Hypertension and heart failure	
NICE NG106: Heart failure NICE NG133: Hypertension in pregnancy NICE NG136: Hypertension		
Subsection	2.5.1 Vasodilator antihypertensive drugs	
First choice	Hydralazine Tablets 25mg, 50mg	
Subsection	2.5.2 Centrally acting antihypertensive drugs	
	Methyldopa (pregnancy) Tablets 125mg, 250mg, 500mg	
	Moxonidine (specialist initiation only) Tablets 200micrograms, 300micrograms, 400micrograms	
Subsection	2.5.4 Alpha-adrenoceptor blocking drugs	
First choice	Doxazosin Tablets 1mg, 2mg, 4mg	
Do Not Prescribe	Doxazosin modified release	Criterion 2 (see RAG list)
Subsection	2.5.5 Drugs affecting the renin-angiotensin system	
	Sacubitril/Valsartan (Entresto®▼) Tablets 24mg/26mg, 49mg/51mg, 97mg/103mg	 Following specialist initiation NICE TA388: Sacubitril valsartan for treating symptomatic chronic heart failure with reduced ejection fraction
	2.5.5.1 Angiotensin-converting enzyme inhibitor	
First choice dependent on indication	Lisinopril Tablets 2.5mg, 5mg, 10mg, 20mg	MHRA DSU: Spironolactone and renin-angiotensin system drugs in heart failure: risk of potentially fatal hyperkalaemia (Feb 2016) NICE NG185: Acute coronary syndromes
	Perindopril erbumine Tablets 2mg, 4mg, 8mg	

	Ramipril Capsules 1.25mg, 2.5mg, 5mg, 10mg	NICE CG187: Acute heart failure: diagnosing and managing acute heart failure in adults
Do Not Prescribe	Perindopril arginine Tablets	Criterion 2 (see RAG list)
<p>Additional notes</p> <p>Perindopril should be prescribed generically. Perindopril arginine (Coversyl Arginine®) is not dose equivalent.</p>		
Do Not Prescribe	RESPeRATE® Medical device	Criterion 2 (see RAG list)
Subsection	Miscellaneous	
	Dapagliflozin Tablets 5mg, 10mg	 following specialist advice NICE TA679: Dapagliflozin for treating chronic heart failure with reduced ejection fraction
<p>Additional information</p> <p>MHRA DSU: SGLT2 inhibitors: updated advice on the risk of diabetic ketoacidosis, April 2016</p> <p>MHRA DSU: SGLT2 inhibitors: updated advice on increased risk of lower limb amputation (mainly toes), March 2017</p> <p>MHRA DSU: SGLT2 inhibitors: reports of Fournier’s gangrene (necrotising fasciitis of the genitalia or perineum), February 2019</p> <p>MHRA DSU: SGLT2 inhibitors: monitor ketones in blood during treatment interruption for surgical procedures or acute serious medical illness, March 2020</p>		

2.5.5.2 Angiotensin-II receptor antagonists (ARB)		
First choice dependent on indication	Candesartan Tablets 2mg, 4mg, 8mg, 16mg, 32mg	MHRA DSU: Spironolactone and renin-angiotensin system drugs in heart failure: risk of potentially fatal hyperkalaemia (Feb 2016) NICE NG185: Acute coronary syndromes
	Irbesartan (renal patients) Tablets 75mg, 150mg, 300mg	
	Losartan Tablets 12.5mg, 25mg, 50mg, 100mg	
	Valsartan Capsules 40mg, 80mg, 160mg	
Additional notes <p>ARBs are more expensive than ACE inhibitors. ARBs should be reserved only for those patients who suffer from unacceptable side effects using ACE inhibitors. However if patients have suffered angioedema with an ACE inhibitor then an ARB is not recommended.</p>		
2.5.5.3 Renin inhibitors		
Do Not Prescribe	Aliskiren Tablets	Criterion 2 (see RAG list) NHS England Items which should not be routinely prescribed in primary care: Guidance for CCGs

BNF chapter	2. Cardiovascular system	
Section	2.6 Nitrates, calcium-channel blockers, and potassium channel activators	
Subsection	2.6.1 Nitrates	
	<p>Glyceryl trinitrate</p> <p>Spray 400micrograms</p> <p>Sublingual tablets 300micrograms, 500micrograms</p>	<p>NICE NG106: Heart failure</p> <p>NICE CG126: Stable angina</p>
	<p>Isosorbide mononitrate</p> <p>Modified release tablets 60mg</p> <p><i>Branded generics are available at different acquisition cost. Follow local guidance.</i></p> <p>Tablets 10mg, 20mg</p>	
Subsection	2.6.2 Calcium-channel inhibitors	
	<p>Amlodipine (first choice dihydropyridine)</p> <p>Tablets 5mg, 10mg</p> <p>Lercanidipine (alternative dihydropyridine)</p> <p>Tablets 10mg, 20mg</p>	<p>NICE NG136: Hypertension</p> <p>NICE NG106: Heart failure</p> <p>NICE CG126: Stable angina</p>
First choice dependant on indication	<p>Diltiazem</p> <p>Modified release tablets 60mg (generic)</p> <p>Modified release tablets/capsules – 90mg, 120mg, 180mg, 200mg, 240mg, 300mg.</p> <p><i>Prescribe by brand, not interchangeable.</i></p>	<p>NICE NG185: Acute coronary syndromes</p> <p>NICE CG180: Atrial fibrillation</p> <p>NICE CG126: Stable angina</p> <p>GMMMG guide to generic brand prescribing</p>
	<p>Verapamil</p> <p>Tablets 40mg, 80mg, 120mg, 160mg</p> <p>Modified release tablets/capsules 120mg, 180mg, 240mg</p>	
Do Not Prescribe	<p>Trandolapril/verapamil combination (Tarka®)</p> <p>Capsules (product discontinued)</p>	Criterion 2 (see RAG list)

Subsection	2.6.3 Other anti-anginal drugs	
First choice dependant on indication	Ivabradine (specialist initiation only) Tablets 5mg, 7.5mg	G_n following specialist initiation NICE TA 267: ivabradine MHRA DSU: Ivabradine: carefully monitor for bradycardia MHRA DSU: Ivabradine and the risk of cardiac side effects MHRA DSU: Nicorandil (Ikorel): now for second-line treatment for angina – risk of ulcer complications NICE CG126: Stable angina
	Nicorandil Tablets 10mg, 20mg	
	Ranolazine (specialist initiation only) Tablets 375mg, 500mg, 750mg	
Subsection	2.6.4 Peripheral vasodilators and related drugs	
	Naftidrofuryl Capsules 100mg	NICE TA223: Peripheral arterial disease - naftidrofuryl oxalate
Do Not Prescribe	Cilostazol (Pletal®) Tablets	Criterion 2 (see RAG list)
	Inositol nicotinate (Hexopal®) Tablets	Criterion 1 (see RAG list)
	Pentoxifylline (Triental®) Tablets	Criterion 1 (see RAG list)
	Moxisylyte (Opilon®) Tablets	Criterion 1 (see RAG list)

BNF chapter	2. Cardiovascular system	
Section	2.8 Anticoagulants	
Subsection	2.8.1 Parenteral anticoagulants	
Low molecular weight heparins	Choice of low molecular heparin as per local policies for prophylaxis and treatment of venous thromboembolism.	<p>NICE NG158: Venous thromboembolic diseases: diagnosis, management and thrombophilia testing</p> <p>NICE NG89: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired DVT or PE</p> <p>R, G_n specialist initiation, G_n specialist advice</p> <p>RAG status varies with indication. Please see RAG list for more detail.</p>
Factor Xa inhibitors	<p>Fondaparinux</p> <p>Solution for injection</p>	<p>R, G_n specialist initiation, G_n specialist advice</p> <p>RAG status varies with indication. Please see RAG list for more detail.</p> <p>NG185: Acute coronary syndromes</p>
Hirudins	Bivalirudin (secondary care use only)	<p>R</p> <p>NICE TA230: Bivalirudin for the treatment of STEMI</p>
Subsection	2.8.2 Oral anticoagulants	
<p>NB: There is no preferred 1st line agent – drugs appear in alphabetical order.</p> <p>NICE, in collaboration with Keele University, have produced a decision support tool designed to assist UK healthcare professionals in the appropriate prescribing of anticoagulation therapy for the prevention of stroke in patients with atrial fibrillation.</p> <p>MHRA DSU: Warfarin and other anticoagulants: monitoring of patients during the COVID-19 pandemic, Sept 2020</p> <p>NPSA alert: Inappropriate anticoagulation of patients with a mechanical heart valve, July 2021</p>		
	<p>Apixaban</p> <p>Tablets 2.5mg, 5mg</p>	<p>G_n</p> <p>NICE TA245: Apixaban for prophylaxis of VTE post hip and knee surgery</p> <p>NICE TA275: Apixaban for preventing stroke and SE in non-valvular AF</p> <p>NICE TA341: Apixaban for the treatment and secondary prevention of DVT and/or PE</p>

First choice dependant on indication	<p>Dabigatran Capsules 75mg, 110mg, 150mg</p>	<p>Gn NICE TA157: Dabigatran for prophylaxis of VTE post hip or knee surgery NICE TA249: Dabigatran for prevention of stroke and SE in AF NICE TA327: Dabigatran etexilate for the treatment and secondary prevention of DVT and/or PE</p>
	<p>Edoxaban▼ Tablets 30mg, 60mg</p>	<p>Gn NICE TA354: Edoxaban for treating and for preventing DVT and PE NICE TA355: Edoxaban for preventing stroke and systemic embolism in people with non-valvular AF</p>
	<p>Rivaroxaban▼ Tablets 2.5mg, 10mg, 15mg, 20mg</p>	<p>For management of CAD/PAD: Gn following specialist recommendation. Treatment should be reviewed at least annually by GP. Supportive material in development. NICE TA607: Rivaroxaban for preventing atherothrombotic events in people with coronary or peripheral artery disease</p> <p>For other licensed indications: Gn NICE TA170: Rivaroxaban for prevention of VTE post hip or knee surgery prophylaxis NICE TA256: Rivaroxaban for prevention of stroke and SE in AF NICE TA261: Rivaroxaban for treatment of DVT and prevention of recurrent DVT and PE NICE TA287: Rivaroxaban for treating PE and preventing recurrent VTE NICE TA335: Rivaroxaban for preventing adverse outcomes after acute management of ACS MHRA DSU: Rivaroxaban (Xarelto▼) after transcatheter aortic valve replacement: increase in all-cause mortality, thromboembolic and bleeding events in a clinical trial, Oct 2018 MHRA DSU: Erythromycin: drug interaction with rivaroxaban, Dec 2020</p>
	<p>Warfarin Tablets 1mg, 3mg, 5mg</p>	<p>NICE NG158: Venous thromboembolic diseases: diagnosis, management and thrombophilia testing MHRA DSU: Miconazole (Daktarin): over-the-counter oral gel contraindicated in patients taking warfarin, Sep 2017</p>


Alternatives	Acenocoumarol Tablets 1mg	NICE NG158: Venous thromboembolic diseases: diagnosis, management and thrombophilia testing
Reversal agents		
Apixaban & rivaroxaban reversal agent	Andexanet alfa ▼ Intravenous use 200 mg powder for solution for infusion	R NICE TA697: Andexanet alfa for reversing anticoagulation from apixaban or rivaroxaban
Dabigatran reversal agent	Idarucizumab ▼ Intravenous use 2.5 g/50 mL solution for injection/infusion	R
<p>Additional notes</p> <p>Restrictions on supply of different strengths of warfarin will vary according to local policy. Choice of oral anticoagulant for orthopaedic thromboprophylaxis; apixaban, dabigatran, or rivaroxaban dependant on local protocol. Total supply made from hospital as per local agreements/policies.</p> <p>NICE NG89: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism</p> <p>NICE NG196: Atrial fibrillation: diagnosis and management</p> <p>MHRA Safety Update 2016: Warfarin and calciphylaxis</p> <p>MHRA Safety Update 2013: NOACs and the risk of serious haemorrhage</p> <p>MHRA Safety Update 2020: Direct-acting oral anticoagulants (DOACs): reminder of bleeding risk, including availability of reversal agents</p>		

BNF chapter	2. Cardiovascular system	
Section	2.9 Antiplatelet drugs	
First choice dependant on indication	Aspirin Dispersible tablets 75mg, 300mg	NICE NG185: Acute coronary syndromes NICE NG128: Stroke and transient ischaemic attack in over 16s: diagnosis and initial management NICE CG180: Atrial fibrillation NICE CG107: Hypertension in pregnancy NICE NG89: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired DVT or PE MHRA DSU: clopidogrel, Dec 2013 NICE TA210: Clopidogrel / dipyridamole MR for prevention of occlusive vascular events NICE TA236: Ticagrelor for ACS MHRA DSU: prasugrel, May 2011 NICE TA317: Prasugrel with percutaneous coronary intervention for treating ACS NICE TA420: Ticagrelor for preventing atherothrombotic events after MI
	Clopidogrel Tablets 75mg	
	Dipyridamole Modified release capsules 200mg	
	Prasugrel (Gn specialist initiation only) Tablets 5mg, 10mg	
	Ticagrelor (Gn specialist initiation only) Tablets 60mg, 90mg	
Alternatives	Aspirin/dipyridamole Modified release capsules 25mg/200mg	NICE TA210: Clopidogrel / dipyridamole MR for prevention of occlusive vascular events

Pericarditis		
	Colchicine U Tablets 500 micrograms	Gn following specialist initiation Unlicensed in this indication. See GM prescribing information for primary care.

BNF chapter	2. Cardiovascular system
Section	2.10 Stable angina, acute coronary syndromes, and fibrinolysis
Subsection	2.10.2 Fibrinolytic drugs (secondary care use only)
<p>Thrombolytic drugs: NICE TA47: Glycoprotein IIb/IIIa inhibitors (partially updated by CG94), NICE TA52: Myocardial infarction – thrombolysis, NICE TA264: Stroke (acute, ischaemic) - alteplase are recommended for use in accordance with local care pathways and following NICE guidance: NICE CG94: Unstable angina and NSTEMI.</p>	

BNF chapter	2. Cardiovascular system	
Section	2.11 Antifibrinolytics drugs and haemostatics	
	<p>Tranexamic acid Tablets 500mg</p>	<p>NICE CG44: Heavy menstrual bleeding</p>

BNF chapter	2. Cardiovascular system	
Section	2.12 Lipid regulating drugs	
Statins		
First choice	Atorvastatin Tablets 10mg, 20mg, 40mg, 80mg	NICE CG181: Lipid modification NICE NG28: Type 2 diabetes in adults NICE CG71: Familial hypercholesterolaemia NICE NG185: Acute coronary syndromes MHRA DSU: Statins, Jan 2008 GMMMG: PCSK9 inhibitors in the treatment of hypercholesterolaemia
Alternative	Simvastatin Tablets 20mg, 40mg Rosuvastatin Tablets, 5mg, 10mg, 20mg, 40mg Pravastatin Tablets 20mg, 40mg As a lower intensity statin pravastatin should be reserved for those patients unable to tolerate atorvastatin or simvastatin; see NICE CG181 .	
Do Not Prescribe	Atorvastatin 30mg and 60 mg preparations	Criterion 2 (see RAG list)
Other lipid regulating drugs		
	Bempedoic acid 180 mg tablets Bempedoic acid/ezetimibe 180 mg/10 mg tablets	 following specialist initiation NICE TA694: Bempedoic acid with ezetimibe for treating primary hypercholesterolaemia or mixed dyslipidaemia
	Colestyramine Powder 4g sachet	NICE CG71: Familial hypercholesterolaemia
	Ezetimibe Tablets 10mg As per TA385 as an option: <ul style="list-style-type: none"> in those patients who are unable to take a statin or are intolerant to statins, or for concomitant use in those patients unable to tolerate higher doses of statins 	NICE NG28: Type 2 diabetes in adults NICE CG71: Familial hypercholesterolaemia CG181: cardiovascular disease (including lipid modification) NICE TA385: Ezetimibe for treating primary heterozygous-familial and non-familial hypercholesterolaemia

	<p>Fenofibrate</p> <p>Capsules 67mg, 200mg, 267mg</p> <p>Tablets 160mg</p> <p>As per CG181 - Do not routinely offer fibrates for the prevention of CVD to any of the following:</p> <ul style="list-style-type: none"> • people who are being treated for primary or secondary prevention • people with CKD, type 1 or type 2 diabetes 	<p>NICE CG181: Lipid modification</p> <p>NICE CG71: Familial hypercholesterolaemia</p>
	<p>Inclisiran</p> <p>Pre-filled syringe 284 mg</p> <p>Prescribing and implementation tools are in development by Health Innovation Manchester, info@healthinnovationmanchester.com.</p> <p>The pricing structure agreed by NHSE/I means the NICE approved cost can only be accessed in primary care.</p>	<p>G_n</p> <p>NICE TA733: Inclisiran for treating primary hypercholesterolaemia or mixed dyslipidaemia</p>
	<p>Alirocumab▼</p> <p>Only as per NICE TA393</p> <p>By subcutaneous injection</p> <p>Pre-filled pen 75 mg or 150 mg</p> <p>Pre-filled syringe 75 mg or 150 mg</p> <p>Evolocumab▼</p> <p>Only as per NICE TA394</p> <p>By subcutaneous injection</p> <p>Pre-filled syringe 140 mg</p>	<p>R</p> <p>NICE TA393: Alirocumab for treating primary hypercholesterolaemia and mixed dyslipidaemia</p> <p>R</p> <p>TA394: Evolocumab for treating primary hypercholesterolaemia and mixed dyslipidaemia</p>
<p>Grey drugs</p> <p>Items which are listed as Grey are deemed not suitable for routine prescribing but may be suitable for a defined patient population</p>	<p>Omega 3 acid ethyl esters</p> <p>Omega-3-fatty acids (e.g. Omacor®) should only be used for the treatment of hypertriglyceridaemia under the care of a lipid management specialist. All patients receiving this medication, other than for hypertriglyceridaemia under a lipid management specialist, should have the medication discontinued</p>	<p>G_n following specialist initiation</p> <p>Criterion 1 (see RAG list)</p>
<p>Do Not Prescribe</p>	<p>Colesevelam hydrochloride</p> <p>Tablets 625 mg</p>	<p>Criterion 1 (see RAG list)</p>
	<p>Simvastatin/ezetimibe combination products (e.g. Inegy®)</p> <p>Tablets</p>	<p>Criterion 2 (see RAG list)</p>