







Chapter 2. Cardiovascular System

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Key

	<p>Red drug see GMMMG RAG list <i>Click on the symbols to access this list</i></p>
	<p>Amber drug see GMMMG RAG list <i>Click on the symbols to access this list</i></p>
	<p>Green drug see GMMMG RAG list <i>Click on the symbols to access this list</i></p>
	<p>If a medicine is unlicensed this should be highlighted in the template as follows</p> <p style="text-align: right;">Drug name U</p>
	<p>Not Recommended</p>
	<p>Over the Counter</p>
<p>Order of Drug Choice</p>	<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 hyperkalaemia 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	
	<p>Digoxin</p> <p>Tablets 62.5 micrograms , 125 micrograms , 250 micrograms</p>	<p>NICE CG180: Atrial fibrillation</p> <p>NICE CG108: Heart failure</p>

BNF chapter	2. Cardiovascular system	
Section	2.2 Diuretics	
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	
Alternative	Bumetanide Tablets 1mg, 5mg	
Subsection	2.2.3 Potassium-sparing diuretics	
	Amiloride Tablets 5mg	NICE CG108: Heart failure
Subsection	2.2.3 Aldosterone antagonists	
	Eplerenone (specialist initiation only) Tablets 25mg, 50mg	NTS recommendation NICE CG172: Myocardial infarction - secondary prevention NICE CG108: 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 CG108: Heart failure NICE CG127: Hypertension
Additional notes		
Spironolactone is significantly cheaper than eplerenone; however, there is no data available to compare cost effectiveness in particular group of patients.		

Subsection	2.2.4 Potassium-sparing diuretics with other diuretics	
	<p>Co-amilofruse Tablets 5mg/40mg</p>	<p>Do not use combined preparations first line.</p>


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	 (following specialist initiation) NICE CG180: Atrial fibrillation
	Flecainide (specialist initiation only) Tablets 50mg, 100mg	 (following specialist initiation) NICE CG180: Atrial fibrillation
Supraventricular arrhythmias	Dronedarone (specialist initiation only) Tablets 400mg	 (initiated by specialist & 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 CG108: Heart failure NICE CG127: Hypertension NICE CG126: Stable angina NICE CG172: Myocardial infarction - secondary prevention 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	
Subsection	2.5.1 Vasodilator antihypertensive drugs	
First choice	Hydralazine Tablets 25mg, 50mg	NICE CG108: Heart failure
Subsection	2.5.2 Centrally acting antihypertensive drugs	
	Methyldopa (pregnancy) Tablets 125mg, 250mg, 500mg	NICE CG107: Hypertension in pregnancy
	Moxonidine (specialist initiation only) Tablets 200micrograms, 300micrograms, 400micrograms	NICE CG127: Hypertension
Subsection	2.5.4 Alpha-adrenoreceptor blocking drugs	
First choice	Doxazosin Tablets 1mg, 2mg, 4mg	NICE CG127: Hypertension
Subsection	2.5.5 Drugs affecting the renin-angiotensin system	
	Sacubitril/Valsartan (Entresto [®] ▼) Tablets 24mg/26mg, 49mg/51mg, 97mg/103mg	Gn 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)
	Perindopril erbumine Tablets 2mg, 4mg, 8mg	
	Ramipril Capsules 1.25mg, 2.5mg, 5mg, 10mg	NICE CG108: Heart failure NICE CG127: Hypertension NICE CG172: Myocardial infarction - secondary


		<p>prevention</p> <p>NICE CG187: Acute heart failure: diagnosing and managing acute heart failure in adults</p>
<p>Additional notes</p> <p>Perindopril should be prescribed generically. Perindopril arginine (Coversyl Arginine®) is not dose equivalent and is not included in the formulary.</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)
	Irbesartan (renal patients) Tablets 75mg,150mg, 300mg	
	Losartan Tablets 12.5mg, 25mg, 50mg, 100mg	NICE CG127: Hypertension
	Valsartan Capsules 40mg, 80mg,160mg	NICE CG108: Heart failure NICE CG172: Myocardial infarction - secondary prevention
Additional notes 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.		

BNF chapter	2. Cardiovascular system	
Section	2.6 Nitrates, calcium-channel blockers, and potassium channel activators	
Subsection	2.6.1 Nitrates	
	<p>Glyceryl trinitrate Spray 400micrograms Sublingual tablets 300micrograms, 500micrograms</p> <p>Isosorbide mononitrate Modified release tablets 60mg <i>Branded generics are available at different acquisition cost. Follow local guidance.</i> Tablets 10mg, 20mg</p>	<p>NICE CG108: Heart failure</p> <p>NICE CG126: Stable angina</p>
Subsection	2.6.2 Calcium-channel inhibitors	
First choice dependant on indication	<p>Amlodipine (first choice dihydropyridine) Tablets 5mg, 10mg</p> <p>Lercanidipine (alternative dihydropyridine) Tablets 10mg, 20mg</p>	<p>NICE CG127: Hypertension</p> <p>NICE CG108: Heart failure</p> <p>NICE CG126: Stable angina</p>
	<p>Diltiazem Modified release tablets 60mg (generic) Modified release tablets/capsules – 90mg, 120mg, 180mg, 200mg, 240mg, 300mg. <i>Prescribe by brand, not interchangeable.</i></p>	<p>NICE CG172: Myocardial infarction - secondary prevention</p> <p>NICE CG180: Atrial fibrillation</p> <p>NICE CG126: Stable angina</p>
	<p>Verapamil Tablets 40mg, 80mg, 120mg, 160mg Modified release tablets/capsules 120mg, 180mg, 240mg</p>	<p>GMMMG guide to generic brand prescribing</p>
Subsection	2.6.3 Other anti-anginal drugs	
First choice dependant on indication	<p>Ivabradine (specialist initiation only) Tablets 5mg, 7.5mg</p>	<p> (following specialist initiation)</p> <p>NICE TA 267: ivabradine</p>
	<p>Nicorandil Tablets 10mg, 20mg</p>	<p>MHRA DSU: Ivabradine: carefully monitor for bradycardia</p>
	<p>Ranolazine (specialist initiation only) Tablets 375mg, 500mg, 750mg</p>	<p>MHRA DSU: Ivabradine and the risk of cardiac side effects</p>

		MHRA DSU: Nicorandil (Ikorel): now for second-line treatment for angina – risk of ulcer complications NICE CG126: Stable angina
Subsection	2.6.4 Peripheral vasodilators and related drugs	
	Naftidrofuryl Capsules 100mg	NICE TA223: Peripheral arterial disease - naftidrofuryl oxalate

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.	NICE CG144: Venous thromboembolism 
Hirudins	Bivalirudin (secondary care use only)	NICE TA230: Bivalirudin for the treatment of STEMI
Subsection	2.8.2 Oral anticoagulants	
First choice dependant on indication	Apixaban▼ Tablets 2.5mg, 5mg	NICE TA245: Apixaban for prophylaxis of VTE post hip and knee surgery NICE TA275: Apixaban for preventing stroke and SE in non-valvular AF NICE TA341: Apixaban for the treatment and secondary prevention of DVT and/or PE
	Dabigatran Capsules 75mg, 110mg, 150mg	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
	Edoxaban▼ Tablets 30mg, 60mg	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
	Rivaroxaban▼ Tablets 10mg, 15mg, 20mg	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 TA 287: Rivaroxaban for treating

		PE and preventing recurrent VTE NICE TA 335: Rivaroxaban for preventing adverse outcomes after acute management of ACS
	Warfarin Tablets 1mg, 3mg, 5mg	NICE CG144: Venous thromboembolism MHRA DSU: Miconazole (Daktarin): over-the-counter oral gel contraindicated in patients taking warfarin, Sep 2017
Alternatives	Acenocoumarol Tablets 1mg	NICE CG144: Venous thromboembolism
Dabigatran reversal agent	Idarucizumab▼ Intravenous use 2.5 g/50 mL solution for injection/infusion	 GMMMG NTS (2016): Idarucizumab (Praxbind®▼) for the reversal of dabigatran anticoagulation

Additional notes

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.

[MHRA Safety Update 2016: Warfarin and calciphylaxis](#)

[MHRA Safety Update 2013: NOACs and the risk of serious haemorrhage](#)

[NTS recommendation: Newer Oral Anticoagulants for AF](#)

BNF chapter	2. Cardiovascular system	
Section	2.9 Antiplatelet drugs	
First choice dependant on indication	<p>Aspirin Dispersible tablets 75mg, 300mg</p> <hr/> <p>Clopidogrel Tablets 75mg</p> <hr/> <p>Dipyridamole Modified release capsules 200mg</p> <hr/> <p>Prasugrel (G_n) specialist initiation only) Tablets 5mg, 10mg</p> <hr/> <p>Ticagrelor (G_n) specialist initiation only) Tablets 60mg, 90mg</p>	<p>NICE CG94: Unstable angina & NSTEMI</p> <p>NICE CG68: Stroke</p> <p>NICE CG167: MI with ST elevation</p> <p>NICE CG180: Atrial fibrillation</p> <p>NICE CG107: Hypertension in pregnancy</p> <p>NICE CG172: Myocardial infarction - secondary prevention</p> <p>NTS recommendation: clopidogrel for STEMI</p> <p>MHRA DSU: clopidogrel, Dec 2013</p> <p>NICE TA210: Clopidogrel / dipyridamole MR for prevention of occlusive vascular events</p> <p>NICE TA236: Ticagrelor for ACS</p> <p>NTS recommendation: ticagrelor</p> <p>MHRA DSU: prasugrel, May 2011</p> <p>NICE TA317: Prasugrel with percutaneous coronary intervention for treating ACS</p> <p>NICE TA420: Ticagrelor for preventing atherothrombotic events after MI</p> <p>GMMMG Information for prescribers: Ticagrelor and TA420</p>
Alternatives	<p>Aspirin/dipyridamole Modified release capsules 25mg/200mg</p>	<p>NICE TA210: Clopidogrel / dipyridamole MR for prevention of occlusive vascular events</p>

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	
	Tranexamic acid Tablets 500mg	NICE CG44: Heavy menstrual bleeding

BNF chapter	2. Cardiovascular system	
Section	2.12 Lipid regulating drugs	
Statins First choice	<p>Atorvastatin Tablets 10mg, 20mg, 40mg, 80mg</p>	<p>NICE CG181: Lipid modification: NICE CG66 (87): Diabetes mellitus type II NICE CG71: Familial hypercholesterolaemia NICE CG172: Myocardial infarction - secondary prevention MHRA DSU: Statins, Jan 2008</p>
Statins Alternative	<p>Simvastatin Tablets 20mg, 40mg</p> <p>Rosuvastatin Tablets, 5mg, 10mg, 20mg, 40mg</p> <p>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)</p>	<p>GMMMG: PCSK9 inhibitors in the treatment of hypercholesterolaemia</p>
Bile acid sequestrants	<p>Colestyramine Powder 4g sachet</p>	<p>NICE CG71: Familial hypercholesterolaemia</p>
Ezetimibe	<p>Ezetimibe Tablets 10mg (As per TA132 as an option 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)</p>	<p>NICE CG66 (87): Diabetes mellitus type II NICE CG71: Familial hypercholesterolaemia NICE TA385: Ezetimibe for treating primary heterozygous-familial and non-familial hypercholesterolaemia</p>
Fibrates	<p>Fenofibrate Capsules 67mg, 200mg, 267mg Tablets 160mg (As per CG181 - Do not routinely offer fibrates for the prevention of CVD to any of the following: -people who are being treated for primary or secondary prevention -people with CKD, type 1 or type 2 diabetes)</p>	<p>NICE CG71: Familial hypercholesterolaemia NICE CG172: Myocardial infarction - secondary prevention NICE CG181: Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of CVD</p>

<p>PCSK9 inhibitors</p>	<p>Alirocumab▼ Only as per NICE TA393 By subcutaneous injection Pre-filled pen 75 mg or 150 mg Pre-filled syringe 75 mg or 150 mg</p> <p>Evolocumab▼ Only as per NICE TA394 By subcutaneous injection 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>
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