CHAPTER 2: CARDIOVASCULAR SYSTEM

Updated: January 2018

The following prescribing guidelines are relevant to the cardiovascular system chapter and can be found here:

- ACS dual antiplatelet policy – NSTEMI/anti-platelet therapy (North Derbyshire & Southern Derbyshire)
- ACS dual antiplatelet policy - STEMI (North Derbyshire & Southern Derbyshire)
- Amiodarone monitoring protocol
- Anticoagulation (oral) guideline with warfarin
- Atrial Fibrillation management
- Heart Failure management
- Hypertension (diagnosed with ABPM & NiCe 2004)
- Orthostatic hypotension (OH)- Advisory guidance on the prescribing of midodrine
- Lipid modification therapy- Familial Hypercholesterolaemia & Non-FH
- Low Molecular Weight Heparin prescribing (Enoxaparin & Tinzaparin)

Management of Hypertension – see appendix 1 – 4

In August 2011 NICE published an updated clinical guideline for the management of hypertension NICE CG 127 replacing CG 34. Ambulatory Blood Pressure Monitoring (ABPM) is the preferred method of diagnosis because of its accuracy.

2.1.1 CARDIAC GLYCOSIDES

Digoxin tabs 62.5, 125, 250 micrograms

The NPSA alerts clinicians that digoxin is usually initiated with a loading dose. The use of loading doses of medicines can be complex and error prone. Incorrect use of loading doses or subsequent maintenance regimens may lead to severe harm or death. See http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305 for more information.

2.2 DIURETICS

2.2.1 Thiazides & related diuretics

Bendroflumethiazide tabs 2.5mg

1. Bendroflumethiazide should be prescribed at a dose of 2.5mg for hypertension – higher doses only increase the incidence of metabolic and other side effects.
2. Bendroflumethiazide is the preferred first line thiazide diuretic. Thiazide-like diuretics are second-line based on cost.
3. Indapamide is a 2nd line option. The immediate release tablets are more cost-effective than the modified release tablets
4. Bendroflumethiazide can be added to a loop diuretic in the short term for resistant oedema, when higher doses may be required.

2.2.2 Loop diuretics

Furosemide tabs 20mg, 40mg (1st line)
Bumetanide tabs 1mg
2.2.3 Potassium sparing diuretics and aldosterone antagonists

**Amiloride** tabs 5mg  
**Spironolactone** tabs 25mg, 50mg, 100mg

1. These diuretics are weak if given alone, but their effects are additive with thiazides and loop diuretics.  
2. Thiazide and loop diuretics cause a fall in potassium during the first few weeks of treatment after which levels remain constant. Patients should be initiated on a plain diuretic and amiloride added only if their potassium falls after the first month, or are at particular risk (e.g. those on digoxin).  
3. Spironolactone has more side effects than amiloride and is only indicated for heart failure. Dosage of spironolactone can be started from 12.5mg. For biochemical monitoring of spironolactone see the local heart failure guideline. Eplerenone is **GREEN** only if spironolactone not tolerated  
4. **MHRA Dec 2016** spironolactone- risk of potentially fatal hyperkalaemia. No patient should receive three drugs which block the renin-angiotensin-aldosterone system as hyperkalaemia and renal dysfunction will be common. The safety and efficacy of combining an ACE inhibitor, an ARB and mineralocorticoid receptor antagonist (MRA) is uncertain and the use of these three drugs together is not recommended.

2.2.4 Potassium-sparing diuretics with other diuretics  
**No drug is recommended for this section**

2.2.8 Diuretics with potassium  
**No drug is recommended for this section**

1. They should not be relied upon to prevent or correct hypokalaemia as their potassium content is insufficient (8-10mmol/tab). They are also costly and in most cases unnecessary.

2.3 ANTI-ARRHYTMICS - **Follow consultant recommendations**

2.3.2 Amiodarone tabs 100mg, 200mg

1. Follow the amiodarone monitoring protocol. The NPSA alerts clinicians that amiodarone is initiated with a loading dose. The use of loading doses of medicines can be complex and error prone. Incorrect use of loading doses or subsequent maintenance regimens may lead to severe harm or death. See [http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305) for more information.
2. Dronedarone for the maintenance of sinus rhythm after successful cardioversion is classified as **AMBER** under shared care.  
3. Mexiletine used in life-threatening ventricular arrhythmias is classified as **RED**

2.4 BETA-ADRENOCEPTOR BLOCKING DRUGS

**Atenolol** tabs 25, 50, 100mg (not for heart failure)  
**Bisoprolol** tabs 1.25, 2.5, 3.75, 5, 7.5, 10mg  
**Carvedilol** tabs 3.125, 6.25, 12.5, 25mg

<table>
<thead>
<tr>
<th>Heart failure (target doses of preferred beta-blockers – if tolerated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisoprolol</td>
</tr>
<tr>
<td>Carvedilol</td>
</tr>
</tbody>
</table>

*The recommended maximum dosage is 25mg twice a day for patients with a body weight of less than 85kg, and 50mg twice a day for patients with a body weight above 85kg, provided that the heart failure is not severe.

1. Myocardial infarction treatment with a beta-blocker:  
A beta-blocker is normally continued for at least 12 months post-MI in people without left ventricular systolic dysfunction or heart failure. After 12 months treatment, consider whether to continue or stop the beta-blocker taking into account the extent of coronary disease or evidence of ischaemia, concurrent conditions, and any adverse effects. If there is uncertainty, seek specialist cardiological advice. (CKS)

2.5 HYPERTENSION AND HEART FAILURE (see appendix 1 – 4)

2.5.1 Vasodilator antihypertensive drugs  
See [Heart Failure Guidelines](#)
2.5.2 Centrally acting antihypertensive drugs

**Moxonidine** tabs 200, 300, 400 micrograms

1. May be used as fourth line add on therapy
2. Methyldopa is used for the management of hypertension in pregnancy

2.5.4 Alpha-adrenoceptor blocking drugs

**Doxazosin** tabs 1, 2, 4mg

1. May be used as fourth line add on therapy
2. Doxazosin MR is classified as **BLACK** - more costly than immediate release doxazosin (which can be given once daily), with only marginal benefits in relation to side-effects

2.5.5.1 Angiotensin-converting enzyme inhibitors (ACEis)

**Enalapril** tabs 2.5, 5, 10, 20mg
**Lisinopril** tabs 2.5, 5, 10, 20mg
**Ramipril capsules** 1.25, 2.5, 5, 10mg

1. Not for use in pregnancy. Use in women who are planning pregnancy should be avoided unless absolutely necessary. See [MHRA December 2007](#).
2. Titrate to the maximum tolerated dose in heart failure or MI if target dose cannot be reached
3. Generic perindopril erbumine may be used on the advice of a stroke physician for secondary prevention of stroke and other cardiovascular events
4. Perindopril arginine is **BLACK** – not recommended or commissioned locally
5. No patient should receive three drugs which block the renin-angiotensin-aldosterone system as hyperkalaemia and renal dysfunction will be common. The safety and efficacy of combining an ACE inhibitor, an ARB and mineralocorticoid receptor antagonist (MRA) is uncertain and the use of these three drugs together is not recommended

2.5.5.2 Angiotensin-II receptor antagonists (A2RAs)

**Losartan** tabs 12.5, 25, 50, 100mg
**Candesartan** tabs 2, 4, 8, 16mg

1. Not for use in pregnancy. Use in women who are planning pregnancy should be avoided unless absolutely necessary. See [MHRA December 2007](#).
2. Should be reserved for those patients who definitely need an ACEI and are truly intolerant. RCTs suggest that this should be around 10% of ACEI use.
3. No patient should receive three drugs which block the renin-angiotensin-aldosterone system as hyperkalaemia and renal dysfunction will be common. The safety and efficacy of combining an ACE inhibitor, an ARB and mineralocorticoid receptor antagonist (MRA) is uncertain and the use of these three drugs together is not recommended
4. Sacubitril/valsartan has been classified as **RED** NICE TA 388 for treating symptomatic chronic heart failure with reduced ejection fraction.

<table>
<thead>
<tr>
<th><strong>Heart Failure</strong></th>
<th>target doses of preferred ACEi &amp; ARB – if tolerated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enalapril</strong></td>
<td>10-20mg BD</td>
</tr>
<tr>
<td><strong>Lisinopril</strong></td>
<td>30mg OD</td>
</tr>
<tr>
<td><strong>Ramipril</strong></td>
<td>10mg daily</td>
</tr>
<tr>
<td><strong>Losartan</strong></td>
<td>150mg OD</td>
</tr>
<tr>
<td><strong>Candesartan</strong></td>
<td>32mg OD</td>
</tr>
</tbody>
</table>
ACEi and A2RAs in combination
- **MHRA June 2014** advice that the combination use of medicines from two classes of the renin-angiotensin hormone system blocking agents (this includes ACEi, A2RAs and aliskiren) is not recommended.
- Prescribers are advised not to give patients with diabetic nephropathy an ACEi with an A2RA since they are particularly prone to developing hyperkalaemia.
- The combination of aliskiren with an ACEi or A2RA is contraindicated in patients with kidney impairment or diabetes.

ACEi and A2RA in combination for heart failure
- Some patients with heart failure may have a medical need for treatment with an ACEi and an A2RA. Candesartan (and Valsartan) are licensed as add-on therapy to ACEi for people with symptomatic heart failure who require such a combination despite optimal therapy.
- The triple combination of an ACEi, A2RA and mineralocorticoid receptor antagonist (e.g. aldosterone) or other potassium-sparing diuretic is not recommended.

2.6 NITRATES, CALCIUM CHANNEL BLOCKERS, AND OTHER ANTIANGINAL DRUGS

2.6.1 Nitrates

**GTN pump spray** cfc-free 180 dose
**GTN s/l tabs** 300, 500, micrograms

**Isosorbide mononitrate** (ISMN) tabs 10, 20, 40mg
1. When initiating ORAL NITRATES, start with a low dose and gradually increase the dose upwards.
2. Isosorbide mononitrate – to be given twice daily, the second of the two daily doses should be given after about 8 hours rather than after 12 hours to allow a nitrate-free period, to help avoid tolerance developing. Practically this would mean doses being taken at breakfast and lunchtime or breakfast and teatime.
3. Once daily preparations of isosorbide mononitrate can be much more expensive and should be avoided unless cost-effective choices such as Monomil XL and Tardisc XL are used.

2.6.2 Calcium channel blockers (CCBs)

**Amlodipine** tabs 5mg, 10mg

**Diltiazem slow release** (Zemtard caps 120,180,240,300mg are a cost-effective option)

**Verapamil slow release** 120mg, 240mg
1. The Medicines Control Agency recommends prescribing diltiazem slow release preparations by brand name. This is to avoid patient confusion and because of potentially different side effect profiles. This is also good practice for verapamil SR preparations.
2. Immediate release diltiazem - Tildiem 60 tablets is a cost effective option.
3. Verapamil should not normally be prescribed to patients taking beta-blockers (including eye-drops) by any route. When used together they may precipitate profound bradycardia or hypotension.
4. Nifedipine immediate release preparations are not recommended for angina or long term hypertension. Their use is usually limited to Raynaud’s phenomenon.

2.6.3 Other Antianginal Drugs

**Nicorandil** 10mg, 20mg 3rd or 4th line treatment of angina which is not adequately controlled despite combination therapy
1. **MHRA January 2017** – Nicorandil can cause serious ulceration, including gastrointestinal ulceration which may progress to perforation, haemorrhage, fistula or abscess.
2. **Ivabradine** is GREEN only on consultant/specialist initiation for the following indications:
   a. Heart Failure- as per NICE TA267
   b. Angina if the person cannot tolerate beta-blockers and calcium channel blockers or both are contraindicated – as per NICE CG126

**MHRA December 2014** - when using ivabradine to treat symptoms of chronic angina:
- Only start ivabradine if the resting heart rate is at least 70 beats per minute
- Do not prescribe ivabradine with other medicines that cause bradycardia, such as verapamil, diltiazem or strong CYP3A4 inhibitors
- Monitor patients regularly for atrial fibrillation. If atrial fibrillation occurs, carefully reconsider whether the benefits of continuing ivabradine treatment outweighs the risks
- Consider stopping ivabradine if no or only limited symptom improvement after 3 months
The formulary lists the most clinically and cost effective choices for prescribing in primary care.

The MHRA also remind prescribers of the following:

- Ivabradine is used to treat symptoms of chronic angina in patients unable to tolerate or with a contraindication to beta-blockers. It can also be used in combination with beta-blockers in patients for whom an optimal beta-blocker dose is not enough.
- The recommended starting dose is 5mg twice daily.
- Do not exceed the maximum maintenance dose of 7.5mg twice daily.
- Down titrate the dose if resting heart rate decreases persistently below 50 beats per minute or if the patient experiences symptoms of bradycardia. The dose can be down-titrated to 2.5mg twice daily if necessary.
- Stop ivabradine treatment if the resting hear rate remains below 50 beats per minute or symptoms of bradycardia persist.

3. **Ranolazine** is a **BROWN** drug – for limiting angina as confirmed by a cardiologist. For further information about exceptionality see [traffic light database](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305).

### 2.7.2 Vasoconstrictor sympathomimetics

See **advisory guideline** on the prescribing of midodrine.

### 2.8 ANTICOAGULANTS

#### 2.8.1 Parenteral Anti-coagulants

See [Low Molecular Weight Heparin prescribing](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305) (Enoxaparin & Tinzaparin) guidance.

### 2.8.2 Oral anti-coagulants

**Warfarin** tabs **Use of the 1mg strength is recommended to minimise confusion**

- The NPSA alerts clinicians that warfarin is initiated with a loading dose. The use of loading doses of medicines can be complex and error prone. Incorrect use of loading doses or subsequent maintenance regimens may lead to severe harm or death. See [http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305) for more information.
- Reports of calciphylaxis. Calciphylaxis is a very rare but serious condition causing vascular calcification and skin necrosis. Patients should consult their doctor if they develop a painful skin rash. See [MHRA](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305), July 2016 for further details.

Below are alternative options for use in AF patients. See [AF guidance](http://www.nrls.npsa.nhs.uk/resources/?EntryId45=92305) for details.

- **Rivaroxaban** tabs 15mg, 20mg
- **Apixaban** tabs 2.5mg, 5mg
- **Dabigatran** caps 110mg, 150mg
- **Edoxaban** tabs 30mg, 60mg

See advice below for indication for anticoagulation with antiplatelet.

### Indication for anticoagulation

- When considering treatment for patients who have an indication for anticoagulation, take into account:
  - **bleeding risk**,
  - **thromboembolic risk**,
  - **cardiovascular risk**

**People needing anticoagulation who have had an MI**

- Unless there is a high risk of bleeding, continue anticoagulation and add **aspirin** in people who have:
  - had their condition managed medically, **OR**
  - undergone balloon angioplasty, **OR**
  - undergone CABG surgery

- Continue anticoagulation and add **clopidogrel** in people who have undergone PCI with bare-metal or drug eluting stents.
- Offer clopidogrel with warfarin* to people with a sensitivity to aspirin.
- **Do NOT** routinely offer warfarin in combination with prasugrel or ticagrelor.
- After 12 months since the MI, continue anticoagulation and take into consideration the need for ongoing antiplatelet therapy, taking into account all of the following:
  - the indication for anticoagulation,
  - thromboembolic risk,
  - bleeding risk,
  - cardiovascular risk,
  - the person’s wishes.

- **Do NOT** add a new oral anticoagulant (rivaroxaban*, apixaban* or dabigatran*) in combination with dual antiplatelet therapy.
- Consider using warfarin and discontinuing treatment with a new oral anticoagulant (rivaroxaban, apixaban or dabigatran), unless there is a specific clinical indication to continue it.

(NICE Bites, January 2014;No 60/ NICE CG172)
2.9  Antiplatelet agents  (See appendix 4)

Aspirin 75mg dispersible tabs
Clopidogrel tabs 75mg  
Dipyridamole m/r caps 200mg
Aspirin 25mg + dipyridamole 200mg
Prasugrel tabs 5mg, 10mg  
Ticagrelor tabs 90mg

1. Aspirin is recommended as the first choice antplatelet therapy in patients for secondary prevention of CVD. Aspirin or clopidogrel are not recommended for primary prevention of CV events, including in people with hypertension or diabetes.
2. There is no evidence to suggest that aspirin is effective in treating people with vascular dementia (Cochrane, 2012).
3. Aspirin 75mg dispersible contains very low levels of sodium.
4. Enteric coated aspirin should not be routinely used. There is no evidence to suggest that aspirin EC has a lower GI bleed risk than dispersible aspirin. Aspirin EC is also more expensive.
5. What to do in patients suffering dyspepsia on low dose aspirin
   - Take aspirin with food
   - Reduce dose of aspirin to the minimum effective dose (75mg)
   - Consider co-prescribing antacid, H2 receptor antagonist or low dose proton pump inhibitor

6. Clopidogrel is recommended as the first choice antplatelet therapy in patients who have had an ischaemic stroke, TIA (N.B. unlicensed indication, therefore not included in NICE TA 210 but supported by Derbyshire stroke physicians and ratified by JAPC) or have peripheral arterial disease or multivascular disease.
7. Clopidogrel and a PPI given concurrently may interact, resulting in reduced effectiveness of the clopidogrel. This is the agreed advice, which is supported by cardiologists at Chesterfield and Derby:
   1) Is gastroprotection actually required i.e. is the patient at high risk of bleeding e.g. history of GI tract bleeding?
   2) If a PPI is required lansoprazole* or pantoprazole are preferred options alternatively consider the H2 antagonist ranitidine 300mg bd (off-label).
   Note: *To aid bioavailability of lansoprazole it should be taken 30 minutes before food. If this is difficult pantoprazole 20mg is a better option.

8. Dual antplatelet therapy in the treatment of acute coronary syndrome is covered under separate policies for North and South Derbyshire. These can be found under prescribing guidelines. Stop dates for ticagrelor, clopidogrel and prasugrel should be stated on discharge and documented in the patient notes and in the repeat prescribing section of electronic patient medication records.
9. Ticagrelor 60mg classified BROWN as per NICE TA420 which recommends ticagrelor 60mg BD plus aspirin as an option for preventing atherothrombotic events in adults who had a MI and who are at high risk of a further event. Treatment should be stopped when clinically indicated or at a maximum of 3 years. This would be considered on case by case basis by secondary care and communicated to primary care with clear stop date.

2.11  ANTI-FIBRINOLYTIC DRUGS AND HAEMOSTATICS

Tranexamic acid tabs 500mg  

Included for the management of menorrhagia

2.12  LIPID-REGULATING DRUGS
See lipid modification therapy guidelines- Familial Hypercholesterolaemia (FH) and non-FH

Atorvastatin tabs 10mg, 20mg, 40mg, 80mg  
Simvastatin tabs 20mg, 40mg, 80mg
Pravastatin tabs 10mg, 20mg, 40mg  

1. Existing patients on pravastatin will still be deriving clinical benefit. Discuss the potential risk of changing to a high intensity statin at the next routine medication review with the patient.
2. Atorvastatin chewable tablet is an option for patients with swallowing difficulties.
3. Rosuvatatin is **BROWN** 3rd line use in patients who have complete intolerance of simvastatin, atorvastatin and pravastatin or partial tolerance of other statins at low-moderate doses (simvastatin 40mg, pravastatin 40mg and atorvastatin 20mg max tolerated dose) but not reaching LDL-C target.

4. **See MHRA for interactions**: MHRA in August 2012 updated its advice on interacting drugs and contraindications of simvastatin

5. Ezetimibe is classified as **BROWN** as per NICE 385. Ezetimibe monotherapy is a treatment option in patients truly intolerant to statins. Ezetimibe in combination with a statin is a limited treatment option following intensification of statins.

6. Inegy (simvastatin and ezetimibe) is **BLACK** – more cost effective if prescribed separately.

7. **NICE CG181 does not** recommend the routine use of fibrates or Omega-3 fatty acid compounds for the prevention of CVD to any of the following:
   - People who are being treated for primary or secondary prevention
   - People with CKD
   - People with type 1 diabetes or type 2 diabetes

8. Ciprofibrate has been classified as **BLACK** less cost effective than standard therapy eg. Fenofibrate.

9. Omega - 3 fatty acid compounds - classified **BROWN** after consultant lipid specialist recommendation in patients with severe hypertriglyceridaemia (triglycerides >10mmol/L) after trial of fibrates +/- statin.

10. Alirocumab and evolocumab are **RED** as per NICE TA393 & 394 as options for treating primary hypercholesterolaemia or mixed dyslipidaemia in selected patients, after statin/ ezetimibe treatment have been optimised. They are only recommended by lipid specialist and are supplied through hospital via homecare; GPs may be asked to prescribe statin in conjunction.
Appendix 1 – Antihypertensive drug treatment – CKD

Treat as per NICE CG182 recommendations:

<table>
<thead>
<tr>
<th>Indications</th>
<th>Actions</th>
</tr>
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<tbody>
<tr>
<td>Diabetes</td>
<td>Offer ACE inhibitors/ARB</td>
</tr>
<tr>
<td>ACR &gt;3mg/mmol with or without hypertension or CKD stage¹</td>
<td></td>
</tr>
<tr>
<td>No diabetes</td>
<td>Offer choice of antihypertensive treatment according to NICE clinical guidelines 127, Aug 2011.</td>
</tr>
<tr>
<td>Hypertension and ACR &lt;30mg/mmol</td>
<td></td>
</tr>
<tr>
<td>Hypertension and ACR ≥30mg/mmol</td>
<td>Offer ACE inhibitor/ARBs</td>
</tr>
<tr>
<td>ACR ≥ 70mg/mmol with or without hypertension or cardiovascular disease¹</td>
<td>Offer ACE inhibitor/ARBs</td>
</tr>
</tbody>
</table>

¹Two different ACR thresholds are given here for initiating ACE inhibitor treatment in people with CKD and proteinuria. The potential benefit of ACE inhibitors in this context is greatly increased if the person also has diabetes or hypertension and in these circumstances a lower threshold is applied.

- Treat with ACE inhibitor first, move to ARBs if ACE inhibitors are not tolerated.
- Inform of the importance of reaching the optimal dose, and of monitoring to achieve this safely.
- Titrate ACE inhibitors/ARBs to the maximum tolerated therapeutic dose before adding a second-line agent
  - MHRA June 2014 recommend not prescribing the combination of an ACEI with an A2RA or aliskiren; not to give patients with diabetic nephropathy an ACEI with an A2RA since they are particularly prone to developing hyperkalaemia; and also the combination of aliskiren with an ACEI or A2RA is contraindicated in patients with kidney impairment or diabetes.
- Test eGFR and serum potassium before treatment starts and repeat after 1-2 weeks of treatment and after each dose increase

Other issues in CKD:
- If eGFR <30 then thiazides may not be effective and loop diuretics may be considered
- Ankle swelling with dihydropyridine calcium channel blockers (e.g. amlodipine, felodipine) may be an issue in CKD and should be reviewed in light of any fluid retention

Kidney disease improving global outcomes GFR categories

<table>
<thead>
<tr>
<th>GFR category</th>
<th>eGFR (ml/min/1.73m²)</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>≥90</td>
<td>Normal or high</td>
</tr>
<tr>
<td>G2</td>
<td>60-89</td>
<td>Mildly decreased*</td>
</tr>
<tr>
<td>G3a</td>
<td>45-59</td>
<td>Mildly to moderately decreased</td>
</tr>
<tr>
<td>G3b</td>
<td>30-44</td>
<td>Moderately to severely decreased</td>
</tr>
<tr>
<td>G4</td>
<td>15-29</td>
<td>Severely decreased</td>
</tr>
<tr>
<td>G5</td>
<td>&lt;15</td>
<td>Kidney failure</td>
</tr>
</tbody>
</table>

*Relative to young adult level

(NICE CG182, July 2014)
**Appendix 2 – Blood Pressure targets**

### Clinic blood pressure (hypertension only)
- People aged under 80 years: lower than 140/90mmHg
- People aged over 80 years: lower than 150/90mmHg

### Daytime home readings (or ABPM) (hypertension only) – where white coat hypertension (>20/10mmHg difference at home)
- People aged under 80 years: lower than 135/85mmHg
- People aged over 80 years: lower than 145/85mmHg

### Diabetes with hypertension
- People with diabetes: lower than 140/80mmHg
- People with retinopathy or cerebrovascular disease or with microalbuminuria: lower than 130/80mmHg

### CKD with hypertension
- In people with CKD lower than 140/90mmHg (systolic target range: 120-139mmHg)

### CKD with diabetes & hypertension
- In people with CKD & diabetes lower than 130/80mmHg (systolic target range: 120-129mmHg)

### CKD with diabetes & proteinuria
- ACR > 3mg/mmol Systolic: 120-129mmHg
  with eGFR 30 - ≥60 Diastolic: <80mmHg
- If eGFR < 30 Refer to specialist
Appendix 3 – Pharmacological Treatment of Angina

Identify and manage other risk factors: cholesterol, smoking, hypertension, diabetes.

Titrate anti-angina medications against the person’s symptoms up to the maximum tolerated dosage. Review the person’s response to treatment, including any side-effects, 2-4 weeks after starting or changing drug treatment. The aim of treatment is to reduce symptoms to the point that they are easy for the patient to manage.

Contraindication and intolerance to both

Consultant/specialist to consider monotherapy with:
- Isosorbide mononitrate\(^*\) with asymmetrical dosing

If symptoms still unsatisfactory refer

Consider monotherapy with:
- Ivabradine or
- Nicorandil or
- ranolazine

Consultant/specialist to consider monotherapy with either:
- Ivabradine or
- Nicorandil or
- ranolazine

If symptoms still unsatisfactory refer

Consultant/specialist to consider adding either:
- Ivabradine (after specialist/consultant initiation of weeks) or
- nicorandil or
- ranolazine (after consultant initiation and re-assessment of benefit)

Refer back if symptomatic control is not satisfactory

1. When combining a calcium channel blocker with a beta blocker, use a dihydropyridine calcium channel blocker, for example, slow release nifedipine, amlodipine or felodipine
2. Modified-release preparations are more expensive than standard-release preparations, but this is minimised if prescribed as a cost effective brand such as Tardisc XL or monomil XL. They may be useful for people who find it difficult to comply with the asymmetric dosing required with an immediate release preparation which is necessary to avoid nitrate tolerance.
**Calcium channel blockers**

**Monotherapy** — expert opinion suggests using a rate-limiting calcium-channel blocker (CCB) (diltiazem or verapamil) in preference to a dihydropyridine CCB, reasons include:
- Rate-limiting CCBs, such as verapamil and diltiazem, have the additional action of decreasing myocardial contractility and heart rate.
- Dihydropyridine CCBs can sometimes cause reflex tachycardia, which may increase angina symptoms, although this is more likely to be a problem with short-acting dihydropyridines than with longer-acting preparations.

**As Combination therapy**
- People taking a beta-blocker: prescribe a dihydropyridine CCB (amlodipine, felodipine, or modified-release nifedipine).
- People not taking a beta-blocker: a rate-limiting CCB may be preferred.

If the person has concomitant heart failure: prescribe amlodipine or felodipine.

**Beta-blockers**

There is no good evidence that any one beta-blocker is better than any other in the management of stable angina. If clinically indicated, cardioselective beta-blockers (such as atenolol) can be used in people with chronic obstructive pulmonary disease, but caution should be used if disease is severe.

Titrate the dose of beta-blocker to the target dose (or maximum tolerated dose), according to the person's response and heart rate control (at rest and during exercise). Atenolol 100mg once a day or 50mg twice a day (twice-daily dosing may provide better symptom control).
Appendix 4 – Antiplatelets for the prevention of occlusive vascular events (based on NICE TAG 210)

Had an ischaemic stroke/TIA*

- Clopidogrel*
  - Clopidogrel CI or not tolerated
    - aspirin+ Dipyridamole MR
      - Dipyridamole CI or not tolerated
        - Aspirin
      - Aspirin CI or not tolerated
        - MR Dipyridamole

Had an MI
(For dual antiplatelet treatment following ACS see NSTEMI / STEMI North or South guidance)

- Aspirin
  - Aspirin CI or not tolerated
    - Clopidogrel
      - Clopidogrel CI or not tolerated
        - Aspirin
      - Clopidogrel

PAD or multi-vascular disease**

- Clopidogrel
  - Clopidogrel CI or not tolerated
    - Aspirin

* Clopidogrel is not licensed for use in TIA (and therefore use following TIA is not included in NICE TAG 210) but this treatment pathway is supported by Stroke Physicians in Derbyshire and ratified by JAPC December 2012 and further endorsed in February 2014.

**People with cardiovascular disease who have disease in more than one vascular site are said to have multivascular disease

See [here](#) for local advisory guidance on when to initiate a PPI with an NSAID (or antiplatelet)