Reason for the review

Patients should be on formulary calcium channel blockers where possible. Amlodipine is the most cost-effective dihydropyridine calcium channel blocker (CCB) in its class which also includes felodipine, isradipine*, nifedipine, lercanidipine and nicardipine. Their indications are hypertension and prophylaxis of angina (*hypertension only). Felodipine has traditionally been the most commonly used CCB in NHS D&G; it has long-acting effects on blood pressure and similar side effects to amloidine. NICE guidelines recommend using a CCB that is taken once daily, is generic and minimises cost. This audit therefore provides the opportunity to follow recommended guidelines by switching from twice-daily nifedipine (where appropriate) to amloidine.

It is the experience of the Prescribing Support Team that inappropriate formulations of nifedipine are sometimes prescribed e.g. a 12-hourly preparation is given once daily. Formulations designed for twice daily administration will only provide twenty-four hour blood pressure control when given twice daily. Conversely, once daily preparations are given twice daily when it is unnecessary to do this. Therefore, this audit also gives the opportunity to improve the patient’s blood pressure control and/or rationalize their therapy by changing to amloidine which only needs taken once daily. Where patients need to remain on nifedipine; Adipine XL should be prescribed as this is the most cost-effective once-daily nifedipine tablet.

In addition formulary brands of ditiazem (Angitil SR twice daily or Zemtard XL once daily) and verapamil (Securon SR/Half securon SR) should be used where they are prescribed.

The table below shows the relative cost of selected CCBs for a 28 day treatment period;

<table>
<thead>
<tr>
<th>Calcium Channel Blocker</th>
<th>Cost per 28 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amlodipine 5, 10mg</td>
<td>£0.96, £0.91</td>
</tr>
<tr>
<td>Felodipine 5, 10mg as Plendil®</td>
<td>£3.87, £4.81</td>
</tr>
<tr>
<td>Lercanidipine* 10mg, 20mg as Zanidip® 10mg, 20mg</td>
<td>£1.44, £1.79</td>
</tr>
<tr>
<td>Lacidipine (Motens®) 2mg, 4mg</td>
<td>£2.95, £3.10</td>
</tr>
<tr>
<td>Nifedipine SR 10mg, 20mg as Adalat Retard®</td>
<td>£7.34, £8.81</td>
</tr>
<tr>
<td>Nifedipine SR As Adipine MR® 10mg, 20mg</td>
<td>£3.73, £5.21</td>
</tr>
<tr>
<td>As Adipine XL® 30mg, 60mg</td>
<td>£4.70, £7.10</td>
</tr>
</tbody>
</table>

MIMS March – May 2014, Scottish Drug Tariff June 2014
2 Inclusion Criteria

Search for all patients prescribed the following on repeat prescription within the last 6 months.

- Felodipine /5mg/10mg
- Cardioplean®/Piendl®
- Lercanidipine 10mg/20mg
- Zanidip® 10mg/20mg
- Lacidipine 2mg/4mg
- Motens® 2mg/4mg
- Nifedipine 10mg/20mg/30mg/40mg/60mg
- Adalat Retard®, Adalat LA®, Adipine MR®, Adipine XL®, Coracten SR®, Coracten XL®, Nifedipress MR®, Fortipine LA®, Tensipine MR®, Valni XL®
- Verapamil prescribed as Unilever®, Verapress MR®, Vertab 240®
- Ditiazem prescribed as Adizem SR/XL®, Angitil XL®, Calcicard CR®, Dizem SR/XL®, Slozem®, Tildiem LA/retard®, Viazem XL®

For suggested dose equivalences for CCBs, see Appendix 2

3 Exclusion Criteria

- Uncontrolled hypertension.
- Unstable angina
- Patients with terminal cancer
- Previous switch to an alternative product for this clinical area which caused distress
- Mental health issues likely to have an effect on ability to accept change of medication
- Others as defined by GP

GP will be notified regarding any compliance issues

4 Preparation and planning

Implementation of audit in selected GP practices Prescribing Support Team is as follows:

- Protocol to be discussed with all GPs in the practice to ensure that agreement to proceed is reached.
- Computer search of all patients according to the inclusion criteria.
- Review of patients medical notes and repeat prescribing records, including note of any previous intolerance to amlodipine.
- List of eligible patients to be checked by GP/GPs for any further alterations.
- Letters to be sent to eligible patients and change to be made on the computer system (Appendix 1)
- A BP review to be set at 4 weeks post switch

5 Action

Letters written to all patients outlining the reasons for the switch to ensure they are fully informed and given an opportunity to discuss the switch with either their GP or practice pharmacist. (Appendix 1)

Admin staff in practices to be made aware of changes of repeat medication.

Local pharmacies to be informed of need to reduce stock and of counselling for patients (copy of patient letters supplied)

Report for practices will include number of switches made by the pharmacist/technician and projected cost savings as a result of the recommendations.

Review to be undertaken by:       GP Authorisation:       Date:
Dear Mr/Mrs __________

As part of a review of prescribing, NHS Dumfries and Galloway are currently reviewing all patients prescribed the blood pressure lowering medicine felodipine* /lercanidipine* /lacidipine*/nifedipine* (*delete as appropriate).

The next time you request your prescription, you will notice we have changed your prescription to amlodipine tablets. Amlodipine is a very effective blood pressure lowering medicine and is in the same class of medicines as your previous tablets, but more cost effective. The dose you have been given will have the same effect as your previous blood pressure tablet and it is taken once daily, in the morning. The advice on the avoidance of grapefruit juice is exactly the same.

This change has been made to help doctors to continue to use high quality treatments while making the most effective use of available resources.

We propose to introduce the change with your next prescription. Please finish your remaining medication as normal and then start the new tablets as directed.

Should you have any queries, please contact the Surgery on the number above or, alternatively, you can contact a member of the Prescribing Support Team on ........

Yours sincerely

Name

Prescribing Support Technician
On behalf of the Doctors
Appendix 2: Doses for Calcium Channel Blockers

### Daily doses for CCBs

<table>
<thead>
<tr>
<th>CCB</th>
<th>Starting Dose</th>
<th>Usual Maintenance Dose (Hypertension)</th>
<th>Maximum Daily Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amlodipine</td>
<td>5mg od</td>
<td>5mg to 10mg od</td>
<td>10mg od</td>
</tr>
<tr>
<td>Felodipine</td>
<td>5mg od</td>
<td>5mg to 10mg od</td>
<td>10mg od</td>
</tr>
<tr>
<td></td>
<td>(2.5mg starting dose in the elderly)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lercanidipine</td>
<td>10mg od</td>
<td>10mg to 20mg od</td>
<td>20mg od</td>
</tr>
<tr>
<td>Lacidipine</td>
<td>2mg od</td>
<td>2 to 4mg od</td>
<td>6mg od</td>
</tr>
<tr>
<td>Nifedipine (modified release)</td>
<td>20mg to 30mg od</td>
<td>30mg to 90mg od</td>
<td>90mg od</td>
</tr>
</tbody>
</table>

(From CKS: Hypertension and Leonetti et. al)

### CCB Dose equivalence

Dose equivalence for amlodipine and felodipine has previously been established.¹

i.e. Felodipine 5mg = Amlodipine 5mg  
     Felodipine 10mg = Amlodipine 10mg

The situation is not so straightforward for other CCBs. There is a lack of consistent data for dose equivalences for lercanidipine and nifedipine (controlled release) with amlodipine. However, the above table shows the common starting and maintenance doses for these CCBs and therefore gives an indication as to how these drugs compare with each other.

In a tolerability study by Leonetti et al., Amlodipine 5mg, Lacidipine 2mg and Lercanidipine 10mg were found to have equal blood pressure lowering effect².

Available bioequivalence data shows Adipine XL® 30mg and Adalat LA® 30mg have equivalent absorption profiles, as do Adipine® XL 60mg and Adalat LA® 60mg.³ Adipine MR® 20mg bd is equivalent in its profile to Adalat Retard® 20mg bd.³

Applications to the MHRA for product licenses state that Valni XL® tablets are comparable to Adipine XL® and Nimodrel XL®. Adanif XL claims to be bioequivalent to Adalat LA®.
CCBs differ in their pharmacokinetic profiles and individual patients may respond differently. For this reason, prescribers need to be aware of the necessity for close BP monitoring and dose titration (if necessary) when switching medication. A BP check should be done at four weekly intervals when a change is made.

1. Diagnosis and Management of Hypertension in the Primary Care Setting. Washington, DC: VA/DoD Evidence-Based Clinical Practice Guideline Working Group, Veterans Health Administration, Department of Veterans Affairs, and Health Affairs, Department of Defense, November 1999. Office of Quality and Performance publication 1Q-CPG/HYN-99. (Update 2004). Office of Quality and Performance publication 1Q.
5. MHRA Grant of Marketing Authorisation for Adanif http://www.mhra.gov.uk/home/groups/l-unit1/documents/website/resources/con2025737.pdf accessed 1st August 2011
<table>
<thead>
<tr>
<th>SURGERY:</th>
<th>DATE:</th>
<th>UNDERTAKEN BY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients name/DOB</td>
<td>Calcium Channel Blocker (Brand if appropriate and dose)</td>
<td>Indication (Hypertension/ Angina)</td>
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