Guidance on Prescribing Statins

Please also refer to South London Algorithm for Lipid Management for the Primary and Secondary Prevention of cardiovascular disease (CVD) [www.swlmcg.nhs.uk](http://www.swlmcg.nhs.uk)

The following issues need to be considered when prescribing a statin:

- Have an informed discussion with the patient about the benefits and risks of statin treatment. This should include factors such as benefits from lifestyle modification, informed patient preference, co-morbidities, adherence, polypharmacy, general frailty and life expectancy
- Contraindications and cautions
- Drug interactions
- Baseline and follow up monitoring

Seek further advice before initiating statins in patients with:

- Renal impairment (eGFR <30ml/min/1.73m²)¹
- Liver disease (cirrhosis or hepatitis)
- Untreated hypothyroidism
- Patients with excess alcohol intake (higher-risk drinking): regularly consuming over 50 alcohol units per week (adult men) or over 35 units per week (adult women)
- For patients with prior haemorrhagic stroke or lacunar infarct the balance of risks and benefits of atorvastatin 80 mg is uncertain and the potential risk of haemorrhagic stroke should be carefully considered before initiating this dose

General Contraindications and Cautions

- Hypersensitivity to the individual statin or to any of the excipients
- Active liver disease (Alanine aminotransferase (ALT) or Aspartate aminotransferase (AST) level > 100iu/L), unexplained persistent isolated elevations of serum transaminases and history of liver disease (see table 3 for further details)
- **SIMVASTATIN** - In patients with severe renal impairment (Creatinine Clearance (CrCl) < 30 ml/min)², dosages above 10 mg/day should be carefully considered and, if deemed necessary, implemented cautiously. Alternatively, atorvastatin could be used
- Statin use is contraindicated in both pregnancy and lactation. Women of child-bearing age must be advised of the potential teratogenic risk of statins and to stop taking them if pregnancy is a possibility. Consideration should be given to delaying statin treatment or addressing contraceptive needs. Those who are planning a pregnancy and are on a statin treatment should be advised to stop 3 months before they attempt to conceive and not to restart the statin until breastfeeding is finished
- If statin therapy is contraindicated, not tolerated or not effective:
  - Do not offer nicotinic acid or bile acid binder or omega-3 fatty acids to lower CV disease risk.
  - Do not routinely consider treatment with a fibrate. Concomitant use of fibrates and statins increases the risk of muscle toxicity. Seek specialist advice

Managing statin intolerance

- Patient unable to tolerate high intensity statin should use the maximum tolerated dose
- Patient should be informed any statin at any dose will reduced the CVD risk
- If a patient reports adverse effects when taking high intensity statin, consider the following strategies:
  - Stopping the statin and re-starting treatment when the symptoms have resolved to determine if the symptoms were related to the statin
  - Reduce the dose within the intensity statin group,
  - Change to a lower intensity statin or consider a water soluble statin
  - Do not offer co-enzyme Q 10 or vitamin D to improve adherence to statin
- Seek specialist advice for patients at high risk of CVD including those with CKD, type 1 diabetes, type 2 diabetes or genetic dyslipidaemia and those with CVD, who are intolerant to 3 different statins

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¹ Estimated Glomerular Filtration Rate (eGFR) used as per NICE guideline
² CrCl used as per simvastatin Summary of Product Characteristics (SPC)
Baseline assessment prior to statin initiation

- Perform baseline blood tests, a clinical assessment and treat co-morbidities and secondary causes of dyslipidaemia. The following should be included in the assessment:
  - Smoking Status
  - Alcohol Consumption
  - Blood pressure
  - Body mass or other measures of obesity
  - Lipid profile: Total cholesterol (TC), non-HDL cholesterol (non-HDL), HDL cholesterol (HDL) and triglycerides
  - HbA1c (glycated haemoglobin)
  - Renal function and eGFR
  - Transaminase level (alanine aminotransferase or aspartate aminotransferase)
  - Thyroid-stimulating hormone
  - Estimate risk of CVD for primary prevention

Table 1 Potency table for reduction in LDL cholesterol

<table>
<thead>
<tr>
<th>Dose (mg/day)</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>40</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluvastatin</td>
<td>–</td>
<td>–</td>
<td>21</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Pravastatin</td>
<td>–</td>
<td>20</td>
<td>24</td>
<td>29</td>
<td>–</td>
</tr>
<tr>
<td>Simvastatin</td>
<td>–</td>
<td>27</td>
<td>32</td>
<td>37</td>
<td>42a</td>
</tr>
<tr>
<td>Atorvastatin</td>
<td>–</td>
<td>37</td>
<td>43</td>
<td>49</td>
<td>55</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td>38</td>
<td>43</td>
<td>48</td>
<td>53</td>
<td>–</td>
</tr>
</tbody>
</table>

*a Advice from the MHRA: there is an increased risk of myopathy associated with high-dose (80 mg) simvastatin. The 80 mg 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.

Low intensity statin: Reduction in low-density lipoprotein cholesterol is 20% to 30%
Medium intensity statin: Reduction in low-density lipoprotein cholesterol 31% to 40%
High intensity statin: Reduction in low-density lipoprotein cholesterol is > 40%

Table 2 Interactions with statins

<table>
<thead>
<tr>
<th>Interacting drug or food</th>
<th>Simvastatin (for full details – see BNF or SPC)</th>
<th>Atorvastatin (for full details – see BNF or SPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYP3A4 inhibitors including: Itraconazole Ketoconazole Posaconazole Erythromycin Clarithromycin Telithromycin and HIV protease inhibitors (e.g. nelfinavir). Nefazodone, Ciclosporin Danazol, Gemfibrozil</td>
<td>All are contraindicated with simvastatin</td>
<td>Avoid if possible: consider temporary suspension of atorvastatin if an interacting drug is taken for short period; Advice on specific list: Itraconazole: do not exceed 40 mg atorvastatin daily; Clarithromycin: do not exceed 20 mg atorvastatin daily; HIV protease inhibitors: monitor lipid levels to ensure lowest necessary dose of atorvastatin is used. Ciclosporin: Do not exceed 10 mg atorvastatin daily Danazol: No restriction in Summary of Product Characteristics</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>Avoid if possible. May increase plasma concentration of simvastatin when used concomitantly. There is no specific dose</td>
<td>Avoid if possible. May increase plasma concentration of atorvastatin therefore a lower maximum dose of atorvastatin should be considered with caution and</td>
</tr>
</tbody>
</table>

3 eGFR used as per NICE guideline
4 For details of other statin drug interaction information, please refer to their individual SPCs (Fluvastatin, Pravastatin and/or Rosuvastatin) or the BNF

Participating CCGs: Croydon, Kingston, Merton, Richmond, Sutton, Wandsworth
Participating Trusts: Epsom and St Helier, Croydon, Kingston, St George’s [added March 2017]
<table>
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<tr>
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<th>Atorvastatin (for full details – see BNF or SPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone, Amlodipine, Diltiazem, Verapamil</td>
<td>adjustment and caution should be exercised with appropriate clinical monitoring</td>
<td>Ensure lowest necessary dose of atorvastatin is used when co-administered with amiodarone, verapamil or diltiazem</td>
</tr>
<tr>
<td></td>
<td>Do not exceed 20 mg simvastatin daily (as these drugs increase plasma concentration of simvastatin)</td>
<td>For co-administration with amlodipine, there is no specific recommendation</td>
</tr>
<tr>
<td>Grapefruit or grapefruit juice</td>
<td>Avoid grapefruit juice</td>
<td>Limit intake of grapefruit juice to very small quantities (or avoid altogether)</td>
</tr>
<tr>
<td>Warfarin/coumarins</td>
<td>Monitor INR before starting treatment and regularly during treatment, especially with dose changes</td>
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</tr>
<tr>
<td>Fibrates (except fenofibrate)</td>
<td>Concomitant use of fibrates increases risk of myopathy; do not exceed 10 mg simvastatin daily (except with fenofibrate, where the evidence suggests no clinical important interaction. Nevertheless, concurrent use should be undertaken only if the benefits of treatment outweigh the risks) Co-administration with Gemfibrozil is contraindicated</td>
<td>Concomitant use of fibrates increases risk of myopathy; use lowest starting dose and patient should be monitored and advised to report any signs of myopathy and possible rhabdomyolysis (i.e. otherwise unexplained muscle pain, tenderness or weakness or dark coloured urine).</td>
</tr>
<tr>
<td>Ezetimibe</td>
<td>Additive risk of myopathy cannot be ruled out with Concomitant use. There is no restriction in SPC and patient should be monitored and advised to report any signs of myopathy and possible rhabdomyolysis (i.e. otherwise unexplained muscle pain, tenderness or weakness or dark coloured urine)</td>
<td>Additive risk of myopathy cannot be ruled out with Concomitant use. There is no restriction in Summary of Product Characteristics (SPC) and patient should be monitored and advised to report any signs of myopathy and possible rhabdomyolysis (i.e. otherwise unexplained muscle pain, tenderness or weakness or dark coloured urine)</td>
</tr>
<tr>
<td>Fusidic acid</td>
<td>Concomitant use with systemic fusidic acid is not recommended. Temporary suspension of simvastatin should be considered for short courses of systemic fusidic acid and restart simvastatin 7 days after the last dose of fusidic acid. In exceptional circumstances where prolonged systemic fusidic acid is needed, co-administration may be considered on an individual basis and under close medical supervision</td>
<td>Concomitant use of atorvastatin with systemic fusidic acid is not recommended. Temporary suspension of atorvastatin should be considered for short courses of systemic fusidic acid and restart atorvastatin 7 days after the last dose of fusidic acid. In exceptional circumstances where prolonged systemic fusidic acid is needed, atorvastatin 10mg may be considered on an individual basis and under close medical supervision</td>
</tr>
<tr>
<td>Niacin (nicotinic acid) (≥ 1 g/day)</td>
<td>For Asian patients, not recommended with simvastatin</td>
<td>Risk of myopathy may be increased with concomitant use. If possible consider alternative non-interacting treatment</td>
</tr>
</tbody>
</table>
Table 3: Monitoring Statin Therapy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lipid Levels</strong></td>
<td><strong>Baseline lipid profile should be measured before starting a statin. Lipid profile should be measured and reviewed annually to check efficacy and on-going adherence to therapy</strong></td>
</tr>
<tr>
<td>Total cholesterol (TC)</td>
<td><strong>Primary CVD prevention including people with type 2 diabetes or people with type 1 diabetes who meet criteria:</strong> Reinforce lifestyle issues and check adherence to medication. There are no specific lipid treatment targets for primary prevention, but if patient is considered higher risk due to the presence of multiple cardiovascular risk factors, consider increasing statin dose if necessary to reduce non-HDL cholesterol by 40% from baseline. Routine safety and efficacy monitoring should be undertaken. Patients should be reviewed annually, with lipid monitoring, to check efficacy and on-going adherence to therapy. Lifestyle issues should be revisited regularly.</td>
</tr>
<tr>
<td>High density lipoprotein (HDL)</td>
<td></td>
</tr>
<tr>
<td>Non-HDL cholesterol (non-HDL)</td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td></td>
</tr>
<tr>
<td><strong>Thyroid Function Tests</strong></td>
<td><strong>Check before initiating a statin to exclude hypothyroidism</strong></td>
</tr>
<tr>
<td><strong>Liver Function Tests (LFTs)</strong></td>
<td><strong>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 month, but not again unless clinically indicated.</strong></td>
</tr>
<tr>
<td>ALT or AST</td>
<td>If transaminases &gt;3x upper limit of normal (ULN) do not start a statin. If patient is already on treatment then discontinue the statin and re-test after 3 months. If still raised, refer to specialist For lesser increases in transaminases, which remain elevated at 6 months consider specialist advice</td>
</tr>
<tr>
<td><strong>Creatine kinase (CK)</strong></td>
<td><strong>Routine CK monitoring after initiation is not recommended. CK should be measured during treatment when clinically indicated – i.e. where there are symptoms of muscle pain or tenderness, muscle weakness or muscle cramps.</strong></td>
</tr>
<tr>
<td></td>
<td>Before offering a statin, it is important to confirm if the patient has had persistent generalised unexplained muscle pain associated or not with previous lipid lowering treatment. If the patient has then measure baseline CK before starting a statin. If CK levels are significantly elevated (&gt; 5 x ULN), re-measure CK after 7 days. If levels remain &gt;5 x ULN, statin treatment should not be started.</td>
</tr>
</tbody>
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5 eGFR used as per NICE guideline
6 eGFR used as per NICE guideline
If CK are raised <5 x ULN, start a statin at a lower dose

Baseline CK should also be measured before starting a statin in those who may already be taking medicines that will increase the risk of myopathy when used concomitantly, for example, fibrates.

CK should not be measured following strenuous exercise or in the presence of any plausible alternative cause of CK increase as this makes value interpretation difficult. If CK levels are significantly elevated at baseline (> 5 x ULN), levels should be re-measured within 5 to 7 days later to confirm the results.

Patients should be counselled on initiation of statin to report any usual muscle pain, tenderness or weakness during treatment. If this occurs during treatment:

- Rule out common causes (e.g. exercise)
- Check TFTs (hypothyroidism predisposes to myopathy)
- Measure CK
  - If CK elevated > 5 x ULN stop and seek advice
  - If CK elevated < 5 x ULN, follow the strategy below:
    a) Monitor carefully by repeating CK level in one month
    b) If remains elevated, reduce dose and recheck CK level in one month
    c) If still remains elevated consider seeking advice
- If symptoms continue STOP statin and consult a specialist before re-initiating

Note: Some Black African and Caribbean’s have elevated baseline levels of CK. This is not a contra-indication to statin therapy. In these patients, after initiation if the CK > 5 x baseline - seek advice

IF MYOSITIS IS PRESENT OR SUSPECTED DISCONTINUE STATIN IMMEDIATELY

Other adverse effects

Headache, dyspepsia or insomnia. Evaluate symptoms at each visit.

If symptoms not tolerated:
- Consider changing time of dose (after food if nauseous, morning if sleep disturbed)
- Consider decreasing dose
- Consider using an alternative agent

References

6. SPC Atorvastatin 80mg tablets Pfizer Ltd (updated 02/04/2015). [Online] available from Atorvastatin 80 mg Film Coated Tablets - Summary of Product Characteristics (SPC) - (eMC) accessed 22/06/2015
7. SPC Pravastatin sodium 40mg tablets Aurobindo Pharma - Milpharm Ltd (updated 13/04/14) [Online] available from Pravastatin sodium 40 mg tablets - Summary of Product Characteristics (SPC) - (eMC) accessed 24/06/2015


Participating CCGs: Croydon, Kingston, Merton, Richmond, Sutton, Wandsworth

Participating Trusts: Epsom and St Helier, Croydon, Kingston, St George's [added March 2017]

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