Statins are effective for secondary prevention of cerebral and cardiac events, although no specific studies exist for patients over the age of 80 years. Numbers needed to treat for secondary prevention are in the 20-40 range (for 5 years of treatment).

Statins are considerably less effective for primary prevention of cardiac and cerebral events with numbers needed to treat in the order of 70-130.

Adverse effects are related to dose (and levels) and are more frequent in patients with interacting drugs or patients taking higher doses.

The majority of the reduction of LDL seen with all available statins is achieved at the minimum dose.

**Context**

This guide considers the use of HMG-CoA Reductase Inhibitors (Statins) in the context of reducing the risk of cardiovascular and cerebrovascular events.

**Recommended Deprescribing Strategy**

- Given the incremental benefits of statins with dose increases, and the increased risk of adverse effects, the first step in deprescribing a statin may be to minimise adverse effects by using the minimum dose of the statin.
- In appropriate patients with reduced life expectancy, a relatively low risk of cardiovascular events or who is experiencing possible adverse effects the decision to stop (or a trial of cessation to see if adverse effects improve) may be considered.
- In patients with a limited prognosis, statins should be stopped.
- Statins can usually be stopped without the need for tapering.

**Background**

Statins are one of the most commonly used preventative medications in Australia, with established efficacy for the reduction of secondary cardiac and cerebral events.

In community dwellings of patients 75 years of age or older, 43% are taking a statin. In residential care, statin use was reported at 41% for patients 70-79 years old, 38.5% for those 80-89 years old and 17.7% for those 90 years old or over.
STATINS

STATINS FOR PRIMARY PREVENTION

The majority of evidence in older patients is from subset analysis of larger trials. These are summarised in Table 1 to the right. In a meta-analysis of primary prevention trials,1 the authors concluded that “In elderly subjects at high CV risk without established CV disease, statins significantly reduce the incidence of MI and stroke, but do not significantly prolong survival in the short-term.”

Statins, compared with placebo, significantly reduced the risk of MI (ARR 1.5%; NNT 66 over 3.5 years; p = 0.003) and the risk of stroke (ARR 0.9%; NNT 111 over 3.5 years; p=0.006). The risks of all-cause death were not significantly reduced. No specific randomised trials or subset analysis for patients over 80 years of age have been identified.

The efficacy of the statins (at least in terms of LDL reduction) only increases incrementally with dose increases, and the use of the minimum dose of whichever statin provides the majority of the LDL reduction benefit (see Figure 1).

STATINS FOR SECONDARY PREVENTION

Significant benefit has been demonstrated in terms of mortality and number of cardiovascular events in patients over 65 years of age with established cardiovascular disease in multiple large trials.10,11,12,13,14,15,16,17 In addition, subgroup analysis of older patients (over 65 years of age) from large trials have shown similar benefit to younger patients in the same trials.15,16

Overall, these subgroup analyses consist of patients who are between 65 and 75 years old and the numbers needed to treat (for mortality or a major primary end point of MI, stroke or revascularisation) are between 16 and 43 at approximately 5 years of follow-up.

There is only limited evidence, from one specific trial and subset analysis of a larger trial, for benefit of statins vs placebo in patients over 75 years old.

- The PROSPER study randomised patients 70-82 years of age (mean age 75.4) with cardiovascular disease or risk factors for cardiovascular disease to receive pravastatin or placebo with an average follow-up of 3.2 years. For patients with prior vascular disease, the primary end point of coronary death, MI or stroke occurred in 227/1306 (17.4%) or the statin group and 273/1259 (21.7%) of the placebo group. Absolute risk reduction was 4.3% (NNT 23.2 over 3.2 years).1

- Subset analysis of one study reported the results of statin use (40mg simvastatin) vs placebo in 1263 CVD patients aged 75-80 years at study entry. They were followed for 5 years and 142/615 (23.1%) of the statin group and 209/648 (32.3%) of the placebo group had major cardiovascular events (stroke, revascularisation or infarction) over 5 years. Absolute risk reduction was 9.2% (NNT ~11 over 5 years).2

- No specific trials or subset analysis for patients over 80 years of age have been identified.

Table 1: Statin Primary Prevention Studies in the Elderly

<table>
<thead>
<tr>
<th>REF</th>
<th>PATIENTS/CHARACTERISTICS/TREATMENT/AGE RANGE</th>
<th>ELDERLY SUBGROUP</th>
<th>RESULTS IN ELDERLY SUBGROUP (ENDPOINT; RATE [TREATMENT VS PLACEBO]; ARR; NNT; STATISTICAL SIGNIFICANCE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROSPER1</td>
<td>3239/ no previous vascular disease/ Pravastatin/ 70-82</td>
<td>100%</td>
<td>Fatal CHD, MI, Stroke: 11.4% vs 12.1%; p=0.19 NS</td>
</tr>
<tr>
<td>AFCAPS2</td>
<td>6605/ no previous cardiac or vascular disease, no hyperlipidaemia/ Lovastatin/ 45-75</td>
<td>3180 (males over 57. Females over 63)</td>
<td>MI, USA, SCD: 4.9% vs 7.0%, NS</td>
</tr>
<tr>
<td>ASCOT-LLA3</td>
<td>10305/hypertension + 3 or more other CVD risk factors/ Atorvastatin/ 40-79</td>
<td>6570 &gt;60yo</td>
<td>MI, fatal CHD, 2.2% vs 3.4%; ARR 1.2%, NNT 83.3 over 3.3 years; p= 0.0027</td>
</tr>
<tr>
<td>CARDS4</td>
<td>3249/T2DM, no previous CVD, +1 or more CVD risk factors/ Atorvastatin/ 40-79</td>
<td>1129; &gt;= 65yo</td>
<td>ACS, Stroke, 7.2% vs 11.1%; ARR 3.9%; NNT 25.6 over 3.9 years; p= &lt; 0.05</td>
</tr>
<tr>
<td>JUPITER5</td>
<td>17802/no hyperlipidaemia, no CVD, elevated hsCRP / Rosuvastatin/ 60-71</td>
<td>5695; 70-97yo</td>
<td>MI, Stroke, USA, CVD death; 1.22% vs 1.99%; ARR 0.77%; NNT 130 annual; p= &lt; 0.001</td>
</tr>
<tr>
<td>MEGA6</td>
<td>7832/ hypercholesterolaemia, no prior CVD/40-70</td>
<td>1814; &gt; = 65yo</td>
<td>CHD:4.8% vs 7.2%; NS Mortality: 5.2% vs 7.3%; NS Stroke: 2.5% vs 5.8%; ARR 3.3%; NNT 68 annual; p= &lt; 0.05</td>
</tr>
</tbody>
</table>

Figure 1: Effects of Statins and their doses9
Safety data from clinical trials show relatively good tolerance of statins, even in the older age groups.20,21 Adverse effects are dose/level related and lower doses are associated with a lower rate of adverse effects. In the subgroup analysis of the TNT trial, persistent AST or ALT elevations more than 3x normal occurred 24 times (1.3%) in 1937 patients taking 80mg of atorvastatin compared to once (0.1%) in 1872 patients taking 10mg of atorvastatin.15 Withdrawals due to adverse effects were also higher in the higher dose group (12.3% vs 9.5%).

Many practitioners will, however, be aware of multiple adverse effects reported by patients taking statins. These include a variety of muscle effects, fatigue and impact on cognition/memory.

In real world surveys of patients taking statins report higher rates of intolerance and discontinuation, due to adverse effects (predominantly muscle related), cost or perceived ineffectiveness/lack of necessity. Rates in these studies were high, as the methodology involved an internet based survey. Muscle-related side effects were reported by 60% and 25% of former and current users, respectively (P < 0.05). Nearly half of all respondents switched statins at least once. The primary reason for switching by current users was cost (52%) and the primary reason for discontinuation was side effects (62%).22

**Fatigue/energy**

In a randomised study of the effects of statins on energy and fatigue, both pravastatin and simvastatin reduced energy levels and increased fatigue, with women being disproportionately affected.24

**Impact on memory**

A systematic review of the impact of statins on cognitive function was unable to find a clear association.25 The authors stated that the level of evidence available was of low quality and that measurements of cognitive function should be included in any future trials of antihyperlidaemic treatments.

**Muscle effects**

Muscle related adverse effects are dose (and therefore level) related and are increased by range of drug interactions with common medications. This may be one reason why these symptoms are reported more frequently in the elderly (as they take more medication).26 Other factors are renal and hepatic impairment, hypothyroidism, low body weight, interacting medications and intercurrent illnesses.15, 27

**Diabetes**

There has been some attention to an increase in the risk of diabetes in patients taking statins. This area was recently reviewed and summarised.28 The excess risk of diabetes appears to be confined to those who are already at risk for developing diabetes. Diabetes is diagnosed only 2-4 months earlier in statin-treated patients and therefore is unlikely to have long-term adverse consequences. The author concluded that “the clinical impact of statin-associated diabetes is likely unimportant. The cardiovascular risk reduction benefit from statins far outweighs the potential for adverse effects in all but the very lowest risk individuals.”28

**Discontinuation syndromes**

None described
RESOURCES

- QUICK REFERENCE GUIDE
- GENERAL INFORMATION
- ALLOPURINOL
- ANGIOTENSIN RECEPTOR BLOCKERS
- ANTIPLATELET AGENTS
- ANTIPSYCHOTICS
- BENZODIAZEPINES
- BISPHOSPHONATES
- CHOLINESTERASE INHIBITORS
- CLAUSTROPHOBIA DROPS
- NSAIDS
- OPIOIDS
- PROTON PUMP INHIBITORS
- STATINS
- SULPHONYLUREAS
- VITAMIN D AND CALCIUM

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18. Tikkkanen, M. et al. Comparison of efficacy and safety of atorvastatin (800mg) to simvastatin (20 to 40mg) in patients aged <65 versus > or = 65 years with coronary heart disease (from the incremental Decrease through Aggressive Lipid Lowering [IDEAL] study). Am J Cardiol. 103(5): 577-582 (2009).

AUTHORSHIP

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