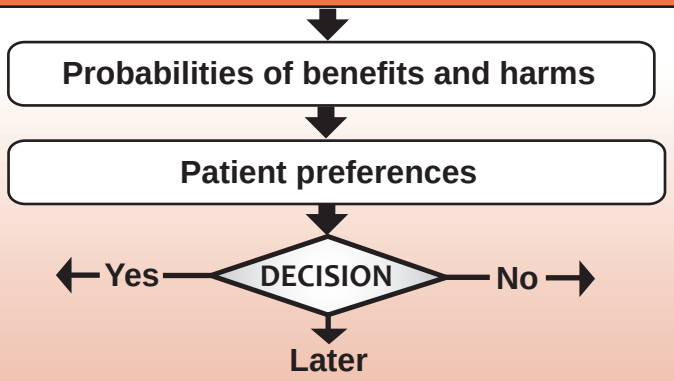
Statins for primary prevention of cardiovascular disease



This document prepares the clinician to discuss scientific data with the patient so that they can make an informed decision together.

Presenting statins to patients

What are statins for?

Statins are **medications taken daily** to reduce the concentrations of **cholesterol in the blood** and reduce the risks of having **cardiovascular (CV)** or **cerebrosvascular (CeV) events**.

Among individuals who have never had cardiovascular disease (primary prevention), who might consider using statins?

- Adults at **moderate to high risk** of developing cardiovascular disease in the next 10 years.

  The probability of having a CV event in the next 10 years is evaluated using a **risk calculator** such as the **Framingham Cardiac Risk Score*** taking into account sex, age, diabetes, smoking status, cholesterol levels and blood pressure.

  - **high risk:** more than 20% probability
  - **moderate risk**: 10-20% probability
  - **low risk:** less than 10% probability

Why do patient preferences matter when making this decision?

- **There are pros and cons to taking this medication:**

PROS: About 1% of individuals taking statins will be **protected** from major coronary and cerebrovascular events.[2]

CONS: Some individuals taking statins will still have a CV event. Most people at moderate or high risk will never have a CV event, even if they do not take statins, and this medication can cause **reversible side effects.**

- There is a **lack of evidence** on the benefits and harms of statins for **primary prevention**, because many of the trials on primary prevention of CV events with statins included individuals who already had CV diseases.
- Cardiovascular disease can also be **prevented** by avoiding smoking, being physically active, maintaining a healthy body weight, moderating alcohol consumption and limiting intake of saturated fat, trans fat, cholesterol, and sugars[8] and/or by taking other medications such as ASA.
- **Both taking and not taking statins are acceptable options, so we propose that:**

  1. The decision takes into account the **patient's values and preferences**
  2. The clinician **shares this decision with the patient**

* http://www.mdcalc.com/framingham-cardiac-risk-score-si-units

Questions to identify the patient's decision making needs:

- Do you have any questions about the benefits and harms of each option?
- Which benefits and harms matter most to you?
- Who will support and advise you in making a choice?
- Do you feel sure about the best choice for you?

See page 2 for the current state of knowledge

State of knowledge – November 2011

Selection of best available studies

Benefits of treatment

❶ Death from all causes*

No death from all causes is prevented in individuals treated with statins.[1]

❷ Major vascular events*

(non-fatal myocardial infaction or stroke, or death from any type of vascular event)

For each 1000 individuals treated with statins for 4 years,

- **10 more (1%)** are protected from **major CV events** compared to 1000 untreated individuals.[2]
- **5 more (0.5%)** are protected from **major cerebrovascular events** compared to 1000 untreated individuals.[2]

Number of infdividuals, among 1000, who **will have a major CV event** if we extrapolate these results[2] to a **10 year follow-up**

	Without statins	With statins	
High risk of a major CV event	250 (25%)	190 (19%)	↓**60 (6%)**
Moderate risk of a major CV event	150 (15%)	110 (11%)	↓**40 (4%)**
Low risk of a major CV event	50 (5%)	40 (4%)	↓**10 (1%)**

Harms of treatment

❶ Myopathy

For each 1000 individuals treated with statins for 4 years, **2 more (0.2%)** experience a myopathy compared to 1000 untreated individuals.[3]

In clinical observational studies, for each 1000 individuals treated with statins, 100 (10%) experience myalgy.[4]

❷ Liver dysfunction

For each 1000 individuals treated with statins, **5 more (0.5%) experience liver dysfunction**, that is an elevation of hepatic enzymes (3-fold), compared to 1000 untreated individuals.[5]

❸ Diabetes

For each 1000 individuals treated with statins, **4 more (0.4%) developed diabetes** compared 1000 untreated individuals.[6]

☞ ***How much confidence can we have in these results?** **Moderate**

These figures are founded mostly on randomized controlled trials with a large number of participants. Most, however, were supported by the pharmaceutical industry and we cannot rule out an overestimation of beneficial effects and an underestimation of adverse effects.[7]

Study descriptions and references:

1. Ray et al. Arch Intern Med 2010, 17(12), 1024-1031. Study Design: systematic review of 11 studies. Participants: 65,000 individuals aged 50-75 years without a history of CV disease. Length of follow-up: mean of 4 years.

2. Brugts et al. BMJ 2009, 338: b2376. Study Design: systematic review of 10 studies. Participants: 70,4000 individuals aged 55 to 75 years with a moderate risk (12.5% over 10 years) of having CV disease and of whom 80% have never suffered from CV disease. Length of Follow up: mean of 4 years.

3. Silva et al. Clin Ther 2006, 28(1), 26-35. Study Design: systematic review of 18 studies. Participants: 71,000 individuals (no details provided). Length of follow-up: mean of 4 years.

4. Bruckert et al. Cardiovasc Drug Ther 2005, 19, 403-14. Study Design: observational study of muscular symptoms in patients receiving high dose statins in France. Participants: 7,924 hyperlipidemic individuals (mean age 58). Length of treatment: a minimum of 3 months prior to study.

5. Hippisley-Cox et al. BMJ 2010, 340, c2197. Study Design: prospective open cohort study. Participants: 2 million individuals from the UK, aged 30-85 years and of whom 10% were new statin users. Maximum length of follow-up: 6 months.

6. Sattar et al. Lancet 2010, 375 (9716), 735-742. Study Design: systematic review of 13 studies. Participants: 91,000 individuals of whom more than 70% did not have diabetes. Length of follow: mean of 4 years.

7. Therapeutics Initiatives 2010, http://www.ti.ubc.ca/sites/ti.ubc.ca/files/77.pdf.

8. American Heart Association Nutrition Committee et al. 2006. Circulation 114 (1): 82-96.