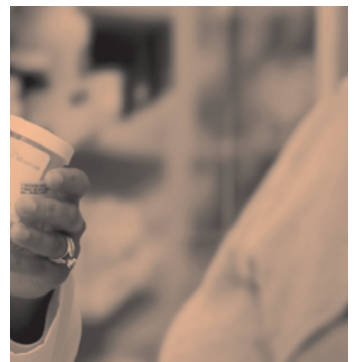
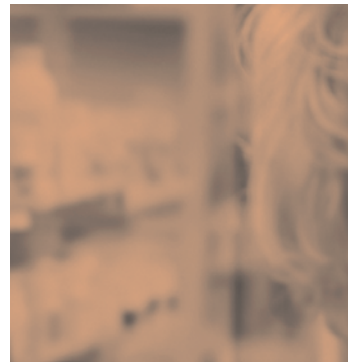
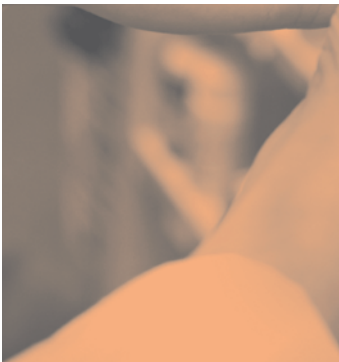


# BEST BUY DRUGS<sup>™</sup>

Evaluating statin drugs to treat:

## High Cholesterol and Heart Disease

Comparing Effectiveness, Safety, and Price



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# Our Recommendations

The cholesterol-lowering medicines known as statins lower the chances of a heart attack and death in people who have an elevated risk of developing heart disease or who already have heart disease.

There are seven statins, but they're not all the same. Some deliver a greater reduction in cholesterol than others. In addition, some statins are backed by stronger evidence that they reduce the risk of a heart attack or death from heart disease or a stroke.

Statin can vary widely in cost as well—from as little as \$12 per month to more than \$500. Most people who take them must continue to do so for years—perhaps for the rest of their life—so the cost can be an important factor to consider.

Your individual circumstances, such as how much you need to lower your cholesterol and whether you have heart disease or have had a heart attack, should also be considered when looking at your options. Certain statins are better depending on your health status. Taking the evidence for effectiveness, safety, and cost into account, we have chosen four statins as *Consumer Reports Best Buy Drugs*:

- Generic lovastatin or pravastatin—if you need to lower "bad" (LDL) cholesterol by less than 30 percent.
- Generic simvastatin (20 mg or 40 mg)—if you need an LDL reduction of 30 percent or more and/or have heart disease or diabetes, or if you've had a heart attack or have acute coronary syndrome and your LDL level is not highly elevated.
- Generic atorvastatin (40 mg or 80 mg)—if you have had a heart attack or have acute coronary syndrome and your LDL is highly elevated.

Most people who need a statin should take the lowest dose that reduces their LDL cholesterol to an acceptable "target" level because higher doses pose a greater risk of serious side effects, such as muscle, kidney, and liver problems. But some people—such as those who have had a heart attack—may require a higher dose. No matter what dose you take, if you experience muscle aches and pains when taking a statin, contact your doctor immediately.

To save money, ask your doctor about splitting your statin pills. This can cut your costs substantially and is a widely accepted practice. Also, certain generic statins cost as little as \$4 for a month's supply through programs run by major chain stores, such as Kroger, Sam's Club, Target, and Walmart. For an even better bargain, you can obtain a three-month supply for \$10 through these programs. We note in the price charts on pages 12 and 14 which generic statins are available through these programs.

*This report was updated in April 2012.*

# Welcome

Statins are used to lower high cholesterol to help prevent heart disease, which can lead to heart attacks, heart failure, and death. Heart disease is the leading cause of death in the U.S., accounting for more than 631,000 deaths in 2006, the most recent year for which figures are available, according to the Centers for Disease Control and Prevention. More than 102 million Americans 20 or older have elevated cholesterol levels, according to figures from the American Heart Association.

The use of statins has increased sharply in recent years, and they are now among the most widely prescribed medicines in the world. According to the most recent data from the National Health and Nutrition Examination Survey (NHANES), 22 percent of Americans 45 years and older take a statin drug.

As a class, statins and their related combination products generated \$14.3 billion in U.S. sales in 2009, according to IMS Health. One statin, Lipitor, was the top-selling drug in the U.S., accounting for \$7.5 billion. A generic version of the drug is now available, so the price of Lipitor and sales are expected to drop.

This report compares statin drugs with each other and will help you talk with your doctor about your choices and heart-disease risk. It is part of a Consumer Reports project to help you find safe, effective medicines that give you the most value for your health-care dollar. To learn more about the project and other drugs we have evaluated, and to get cost updates, go to [www.CRBestBuyDrugs.org](http://www.CRBestBuyDrugs.org).

Your cholesterol level is one important factor that will help determine whether you need treatment with a statin. But it is not the only risk factor for heart disease. Other factors that raise your risk of heart disease include older age, diabetes, a family history of heart disease, high blood pressure, lack of exercise, obesity, and smoking. Your doctor should ask you about those risk factors and take them into consideration before deciding whether a statin is appropriate for you. This free, interactive tool can help you calculate your risk: <http://www.consumerreports.org/health/conditions-and-treatments/heart-health/heart-calculator/heart-calculator-tools-downloads.htm>

Your doctor will measure your cholesterol levels with a simple blood test. The U.S. Preventive Services Task Force (USPSTF) recommends cholesterol screenings for all men 35 and older and women 45 and older. They also recommend that men and women over age 20 with other risk factors be screened. For men 20 to 35 and women of any age who do not have other risk factors for heart disease, screening can improve health outcomes but the balance of benefits and harms of treatment are too close to recommend screening for everyone. The decision should be up to the individual.

Your cholesterol test should include measures of your LDL and HDL levels. LDL stands for “low-density lipoprotein,” and is often called the “bad” cholesterol because it can build up on the walls of your blood vessels and increase your risk of heart disease. HDL, which stands for “high-density lipoprotein,” is called the “good” cholesterol because it helps clear extra cholesterol from your blood. LDL and HDL levels are more meaningful than your total cholesterol level, which generally should be below 200 mg/dL (milligrams per deciliter of blood) (See Table 1 on page 9).

Your doctor is also likely to measure your triglyceride levels. This is a type of fat that has been linked to heart disease, especially in women. But the good news is that lifestyle changes and statins also lower triglycerides.

The increase in statin prescriptions has prompted controversy over the appropriate use of the drugs. Some doctors and public-health advocates are concerned that too many people are being put on a statin before trying to lower LDL cholesterol through dietary and lifestyle changes. Studies have found that reducing the amount of saturated fat you eat can decrease LDL cholesterol levels. And diets rich in fruits and vegetables have been associated with a lower overall risk of premature heart disease. Studies have also found that regular aerobic exercise helps lower LDL and raise HDL levels. Exercise can also help you lose weight, which is associated with a reduction in LDL and a rise in HDL levels.

## C-Reactive Protein

In addition to cholesterol, your doctor might check your blood levels of a substance called C-reactive protein, or CRP, which is a measure of inflammation in the body. Elevated CRP levels (CR medical advisors say 3 mg/L or higher) can be a rough indicator of your risk of heart disease. If your CRP is high, your doctor might prescribe a statin even if your LDL cholesterol level is normal.

This approach is controversial, though, because the benefits of using a statin in this situation might not outweigh the harms. In February, 2010, the U.S. Food and Drug Administration approved a statin, rosuvastatin (Crestor), for use by men older than 50 and women older than 60 who have normal LDL cholesterol levels, but elevated CRP levels and one other risk factor, such as high blood pressure, low HDL, smoking, or a family history of premature heart disease. This new indication means that millions more Americans are potentially eligible to take Crestor. But the FDA made this decision before it recognized that long-term statin use can cause memory loss and diabetes (See page 19 for more about those risks). See more about our recommendations about getting your CRP level checked on page 8.

The consensus is that people who need to lower their LDL levels should modify their diets and adopt healthy lifestyle changes whether or not they are prescribed a statin. But there is no consensus on who needs to lower cholesterol initially by diet and lifestyle changes, and who should start taking a statin as initial therapy for elevated LDL cholesterol.

With only 25 million of the approximately 102 million Americans who have elevated cholesterol levels taking a statin, a decision about diet and lifestyle changes vs. the use of statins could have an impact on tens of millions of people.

There's no easy answer to this, so we leave the decision to you and your doctor because it is beyond the scope of this report to compare diet and lifestyle changes vs. drugs in the treatment of elevated cholesterol. One point worth noting, though, is that people with very high LDL levels are unlikely to be able to lower them enough through diet or exercise alone.

Another emerging issue that is generating controversy is the use of statins in children. This issue is beyond the scope of this report, but we discuss it in detail in a recent article at [www.CRBestBuyDrugs.org](http://www.CRBestBuyDrugs.org).

Seven statins are now available by prescription in the U.S. But one—pitavastatin (Livalo)—had only recently become available as this report was being updated, so it was not included in our evaluation of the statin drugs. Considering that Livalo is new and does not have the long track record of some of the other statins, we would advise avoiding the drug until more is known about it.

The six currently available statins we evaluate are:

| Generic Name | Brand Name(s)     | Available as a Generic Drug? |
|--------------|-------------------|------------------------------|
| Atorvastatin | Lipitor           | Yes                          |
| Fluvastatin  | Lescol, Lescol XL | No                           |
| Lovastatin   | Altoprev, Mevacor | Yes                          |
| Pravastatin  | Pravachol         | Yes                          |
| Simvastatin  | Zocor             | Yes                          |
| Rosuvastatin | Crestor           | No                           |

In addition, three fixed-dose combination products containing a statin and another lipid-lowering drug are available in the U.S. These three drugs are listed on the following page.

| Generic Name          | Brand Name |
|-----------------------|------------|
| Lovastatin + Niacin   | Advicor    |
| Simvastatin/Niacin-ER | Simcor     |
| Simvastatin/Ezetimibe | Vytorin    |

And there is a combination tablet that contains both a statin and a drug used for treating high blood pressure for people who have both conditions. The brand name of that drug, which we do not evaluate in this report, is Caduet. It is a combination of the calcium channel blocker amlodipine (Norvasc and generic) and atorvastatin (Lipitor and generic).

Before you begin taking a statin, talk with your doctor or a nutritionist about dietary and lifestyle changes that could help lower your cholesterol. Even after years of attention to this issue, many people remain confused about what constitutes a cholesterol-lowering and heart-healthy diet. For example, many still believe that simply cutting cholesterol-laden eggs out of their diet will do the trick. It won't if the rest of your diet is high in saturated fats from meat, margarine, butter, and other high-fat dairy products. Exercise is important, too. A report from the National Heart, Lung, and Blood Institute explains how to adopt a healthy diet and start an exercise program to reduce your risk of developing heart disease. It can be found at [http://www.nhlbi.nih.gov/health/public/heart/chol/chol\\_tlc.pdf](http://www.nhlbi.nih.gov/health/public/heart/chol/chol_tlc.pdf).

*This report was updated in April 2012.*

## What Are Statins and Who Needs Them?

Statins work by blocking an enzyme needed to make cholesterol. The body needs some cholesterol to maintain good health. High blood levels of LDL cholesterol and low levels of HDL cholesterol are associated with an increased risk of arterial blockage throughout the body, which can eventually lead to heart attack, stroke, and peripheral artery disease in the legs. Other possible beneficial effects of statins include that they may moderately reduce triglyceride levels, decrease inflammation in arteries, and help raise HDL levels.

Our recommendations about who should be considered a candidate for a statin drug are based on current guidelines from the National Cholesterol Education Program, or NCEP, because they're widely accepted and used by physicians. As this report was being finalized, an updated version of the NCEP guidelines was being developed with a proposed release date of 2012.

We will update this report to reflect any significant new recommendations as they become available.

Your doctor might prescribe a statin if blood tests determine that you have high LDL cholesterol (above 160 mg/dL for some; 130 mg/dL for others) or low HDL cholesterol (below 40 mg/dL for most people), and if diet and exercise changes fail or are unlikely to bring your LDL level down to an acceptable level. As we have previously stated, your doctor should also consider whether you have other risk factors, and assess your total overall risk for heart disease. He or she might decide to prescribe a statin, even if your LDL or HDL levels are within a healthy range, if you:

- Have other conditions or habits—such as diabetes, high blood pressure, or cigarette smoking—that already put you at high risk of having a heart attack or stroke.

## C-Reactive Protein: Should You Be Tested?

Under certain circumstances, your doctor may prescribe a statin drug even if you do not have high cholesterol. In February 2010, the FDA approved rosuvastatin (Crestor) for use by men 50 or older and women 60 or older with healthy cholesterol levels but an elevated CRP level and at least one other risk factor (for example: if you smoke, have high blood pressure or a family history of premature heart disease). The new approval was based on a trial known as "JUPITER," which found that Crestor reduced heart attacks, strokes and death in such people. There are a lot of uncertainties with CRP. The findings of the JUPITER trial have not yet been incorporated into the NCEP guidelines. In addition, statins can cause side effects, including an increased risk of diabetes and a rare but life-threatening muscle tissue breakdown called rhabdomyolysis. So, in our view, it's not yet clear if the benefits of taking a statin are worth the potential risks if you fall into this category.

Should you get your CRP level measured? At this time, our medical advisers agree with the guidelines from the Centers for Disease Control and Prevention and the American Heart Association that say that the decision should depend primarily on your overall risk of cardiovascular disease. People at high risk because they have a clearly elevated LDL level probably don't need the test, since they should be treated with a statin regardless of their CRP level. On the other hand, if you have a low LDL and no other coronary risk factors, a CRP test is still probably unnecessary because it's not clear that the benefit of treatment for such very low-risk people outweighs the costs of statins and possible side effects. But for people at moderate risk of coronary disease—those with a borderline elevated LDL, for example, and one or more other risk factors—knowing their CRP level can help them decide whether or not they should take a statin.

You should also know that all statins—not just Crestor—lower CRP. These include atorvastatin (Lipitor and generic), lovastatin (Mevacor and generic), and simvastatin (Zocor and generic). The generics are considerably less expensive than Crestor, which is currently available only as a brand-name drug.

**Table 1. What Should Your Cholesterol Levels Be?**

| <b>If Your Total Cholesterol Level is:</b> | <b>This is considered:</b> |
|--|----------------------------|
| Less than 200 mg/dL                        | Desirable                  |
| 200-239 mg/dL                              | Borderline                 |
| 240 mg/dL and above                        | High                       |
| <b>If Your LDL Cholesterol Level is:</b>   | <b>This is considered:</b> |
| Less than 100 mg/dL                        | Optimal                    |
| 100-129 mg/dL                              | Near optimal/above optimal |
| 130-159 mg/dL                              | Borderline high            |
| 160-189 mg/dL                              | High                       |
| 190 mg/dL and above                        | Very High                  |
| <b>If Your HDL Cholesterol Level is:</b>   | <b>This is considered:</b> |
| Less than 40 mg/dL                         | Low, increases risk        |
| 41 - 59 mg/dL                              | OK, but less than optimal  |
| 60 mg/dL and above                         | Good, helps lower risk     |

\* This table applies primarily to people with no other risk factors for heart disease.

Source: Adapted from the National Cholesterol Education Program, High Blood Cholesterol – What You Need to Know, revised June 2005. NIH Publication No. 05-3290.

- Have known coronary artery disease.
- Have had a transient ischemic attack or near-stroke.
- Have already had a heart attack or stroke.
- Have acute coronary syndrome (ACS), a diagnosis that encompasses anyone with chest pain and signs on an EKG (electrocardiogram) of coronary artery disease.

To help you figure out your 10-year risk of heart attack, you can use our free risk calculator at <http://www.consumerreports.org/health/conditions-and-treatments/heart-health/heart-calculator/heart-calculator-tools-downloads.htm>. This interactive tool, which is based on your age, blood pressure, gender, levels of total cholesterol and HDL, and whether you smoke, calculates your risk of suffering a heart attack over the next 10 years.

If your doctor decides a statin is appropriate for you, he or she will probably recommend a target LDL level, which will depend on your medical history and your overall risk of heart disease and stroke.

For most people, the goal will be to lower their LDL cholesterol to 130 mg/dL or less. Current recommendations from the National Institutes of Health and the American Heart Association say that an LDL level of 100 mg/dL or lower may be desirable for many people. An LDL level of 70 mg/dL or even lower may be desirable for those at *very high risk* due to multiple, severe, and poorly controlled major risk factors (especially diabetes and smoking).

Tables 1 and 2 on this page and the next page give a rundown of this latest advice on cholesterol lowering. Bear in mind that an elevated LDL level doesn't necessarily mean you need to take a statin. Your heart attack risk, which is based on other factors in addition to cholesterol levels, is an important part of deciding if a statin is appropriate for you. And adopting a healthy diet that is low in saturated fats, trans fats, and cholesterol, and making lifestyle changes such as exercising and losing weight if you need to or quitting smoking if you are a smoker, can help lower your LDL level. These changes might reduce your LDL enough that you won't need to take a statin. Another benefit of those lifestyle modifications is that they might

**Table 2. Do You Need To Reduce LDL?**

| Coronary-risk group   | Consider reducing LDL...   | Definitely reduce LDL...                 |
|---|--|--|
| <b>HIGH</b><br>1. 10-year heart-attack risk about 20%<br>OR<br>2. One or more extreme-risk factors: coronary heart disease, diabetes, peripheral-artery disease, carotid-artery disease, or aortic aneurysm | If it's 70 mg/dl or higher, especially if you have exceptionally high risk because of multiple extreme risk factors, such as coronary disease and diabetes, or multiple standard-risk factors <sup>1,2</sup> | If it's 100 mg/dl or higher              |
| <b>MODERATELY HIGH</b><br>1. 10-year heart-attack risk of 10% to 20%,<br>AND<br>2. Two or more risk factors <sup>1</sup>  | If it's 100 mg/dl or higher <sup>2</sup>   | If it's 130 mg/dl or higher              |
| <b>MODERATE</b><br>1. 10-year heart-attack risk less than 10%,<br>AND<br>2. Two or more risk factors  | If it's 130 mg/dl or higher <sup>2</sup>   | If it's 160 mg/dl or higher              |
| <b>LOW</b><br>1. No risk factors, or one risk factor <sup>1,3</sup>   | If it's 160 mg/dl or higher <sup>2</sup>   | If it's 190 mg/dl or higher <sup>4</sup> |

Adapted from the National Cholesterol Education Program, National Institutes of Health, July 2004; *circulation*, July 13, 2004): Vol.110, pages 227-239.

- Standard coronary-risk factors are: cigarette smoking; coronary disease in a father or brother before the age of 50 or a mother or sister before 55; systolic blood pressure of 140 mm Hg or more, diastolic pressure of 90 mm Hg or more, or use of drugs to treat high blood pressure; and HDL levels less than 40 mg/dl. If your HDL is 60 or more, subtract one risk factor. (High LDL is a major factor, but it's already figured into the table.)
- You may also consider reducing your LDL if you have a CRP level of 3 mg/l or greater.
- People in this group usually have less than a 10 percent 10-year risk. Those with higher risk should ask their doctors whether they need more aggressive treatment than shown here.
- This may not apply to some women or older people.

enable you to take a lower dose of statin, so you should be sure to continue them even if you do need to take a medication.

If your doctor advises the use of a statin, you both face a decision about which one and at what dose. This decision has become more important in recent years as evidence has mounted that (a) the statins differ in their potency and (b) the effectiveness and potential harmful effects of statins increase with the use of larger doses. For some people, however, aggressively lowering LDL cholesterol may be needed to lower their risk of heart attack and stroke more substantially. This might involve a stricter diet with a lower dose of statin, or it could involve taking a more potent statin or a higher dose. The next section discusses the differences in statins and gives our *Best Buy* picks depending on your health circumstances.

### A note about continuing to take your medicine

Adherence to taking statins over the long-term is a significant problem, with studies finding that only about half of the people prescribed one of these drugs is still taking it after six months. By one year, the percentage still taking their medicine drops to only 30 to 40 percent. This is a concern because statins have to be taken continuously over years and probably for the rest of a person's life. Studies have found that people give a variety of reasons for stopping their medication, including cost, forgetfulness, fear of side effects, and the belief that they're not sick enough to need to take a drug. No one strategy for boosting adherence works for everybody. But if you have a problem with sticking with your medicine, you should ask your doctor or pharmacist for suggestions about how you can improve your adherence.

## Choosing a Statin – Our *Best Buy* Picks

All the statins have been found to reduce levels of LDL cholesterol. And most have been found to lower the risk of heart attack and death from heart disease in people with moderate to high risk of heart disease and those who have heart disease or have had a heart attack. But statins differ in their ability to reduce LDL cholesterol. And the evidence is stronger for certain statins when it comes to reducing your risk of heart attack or death from heart disease or stroke.

Statin costs also vary widely. As mentioned, four are now available as generics, and you can save a significant amount of money if you and your doctor choose one of them. This may also help you stay on the drug. If you have no insurance or have Medicare's Part D drug coverage, choosing a generic statin will probably make your drug bill more affordable.

Lipitor recently became available as a generic. However, you will probably not save a lot of money by switching to a generic version until May 2012. This is because only two drug makers are producing the generic form of the drug between now and then. So the price of generic atorvastatin will remain high until May 2012 when more manufacturers are expected to launch their generic versions of the drug, which will drive down prices.

Another factor keeping the cost high is that the maker of brand name Lipitor has reportedly negotiated lower prices for their drug with several insurance companies and pharmacy benefit managers. The result is that the generic is less expensive by about \$28 to \$49, depending on dose, than the brand-name, if you pay out of pocket. However, if you have health insurance or Medicare Part D, your co-pay for Lipitor could actually be less than for the generic. Check with your insurance to determine what your costs will be.

Tables 3 and 4 on pages 12 and 14, respectively, present the average retail prices for statins. As you can see:

- Generic lovastatin costs \$12 to \$54 per month, depending on the dose
- Generic pravastatin costs \$32 to \$72 per month, depending on the dose

- Generic simvastatin costs \$39 to \$69 per month, depending on the dose

Be sure to check prices at online pharmacies and large discount stores, too. Those outlets often have significantly lower prices. Other options include the programs offered by large chains, such as CVS, Target, Walgreens, and Wal-Mart, where a 30-day supply of certain generic drugs, including some statins, costs just \$4 or even less. We note in the price charts on pages 12 and 14 which generic statins are available through these programs. Splitting pills can also save you money. We discuss that in more detail on page 17.

Of course, price is not the only important factor in choosing a statin. You and your doctor will want to consider:

- The amount of LDL cholesterol reduction required to meet your target LDL level
- Your risk factors for heart disease
- The strength of evidence for each statin
- The possibility of drug interactions with medicines you are already taking

Our recommendations focus on the three groups of people who need statins:


- (1) Those who require LDL reductions of less than 30 percent to reach their target LDL
- (2) Those who require LDL reductions of 30 percent or more and/or have heart disease or diabetes
- (3) Those who have had a heart attack or have acute coronary syndrome (ACS)









The 30 percent cutoff is an important factor in choosing a statin. Most people with elevated cholesterol have only slightly or moderately elevated LDL levels and might not need one of the more potent statins. Some statins deliver a greater reduction in LDL levels, on average, than the others. All of the more potent drugs can drop LDL levels by 30 percent or more for

most people, while the less potent statins generally result in a smaller decline. As you can see from Table 4, the most potent statins include the higher doses of atorvastatin (Lipitor and generic), rosuvastatin (Crestor), and simvastatin (Zocor and generic).

Tables 3 and 4 give you a rundown of average statin potency. Remember, your actual LDL reduction might vary from the averages or ranges given in these tables.

**Table 3. Statin Choices for People Who Require LDL Lowering of Less than 30 percent**

**Note:** If the price box contains a , that indicates the dose of that drug is likely available for a low monthly cost through programs offered by large chain stores. For example, Kroger, Sam's Club, Target, and Walmart offer a month's supply of selected generic drugs for \$4 or a three-month supply for \$10. Other chain stores, such as Costco, CVS, Kmart, and Walgreens, offer similar programs. Some programs have restrictions or membership fees, so check the details carefully for restrictions and to make sure your drug is covered.

| Generic Name And Dose Per Day      | Brand Name <sup>1</sup> | Average Monthly Cost <sup>2</sup>  | Average Expected LDL Reduction | Reduces the Risk of Heart Attack? <sup>3</sup> | Mortality Reduction? |
|------------------------------------|-------------------------|--|--------------------------------|--|----------------------|
| <b>Atorvastatin</b>                |                         |  |                                |  |                      |
| Atorvastatin 10 mg                 | Generic                 | \$111  | 34%-38%                        | Yes  | Yes                  |
| Atorvastatin 20 mg                 | Generic                 | \$153  | 42%-46%                        |  |                      |
| Atorvastatin 10 mg                 | Lipitor                 | \$139  | 34%-38%                        |  |                      |
| Atorvastatin 20 mg                 | Lipitor                 | \$191  | 42%-46%                        |  |                      |
| <b>Fluvastatin</b>                 |                         |  |                                |  |                      |
| Fluvastatin 20 mg                  | Lescol                  | \$144  | 22%                            | Likely   | Likely               |
| Fluvastatin 40 mg                  | Lescol                  | \$141  | 25%                            |  |                      |
| <b>Lovastatin</b>                  |                         |  |                                |  |                      |
| CR BEST BUY Lovastatin 10 mg       | Generic                 | \$12  | 21%                            | Yes  | Likely <sup>4</sup>  |
| CR BEST BUY Lovastatin 20 mg       | Generic                 | \$20  | 24%-27%                        |  |                      |
| CR BEST BUY Lovastatin 40 mg       | Generic                 | \$54  | 31%                            |  |                      |
| Lovastatin sustained-release 20 mg | Altoprev                | \$460  | 30%                            | Unknown  | Unknown              |
| Lovastatin sustained-release 40 mg | Altoprev                | \$510  | 36%                            |  |                      |
| <b>Pravastatin</b>                 |                         |  |                                |  |                      |
| Pravastatin 10 mg                  | Pravachol               | \$149  | 23%-29%                        | Yes  | Yes                  |
| Pravastatin 20 mg                  | Pravachol               | \$151  | 23%-29%                        |  |                      |
| Pravastatin 40 mg                  | Pravachol               | \$207  | 26%-34%                        |  |                      |
| CR BEST BUY Pravastatin 10 mg      | Generic                 | \$34  | 18%-25%                        |  |                      |
| CR BEST BUY Pravastatin 20 mg      | Generic                 | \$32  | 23%-29%                        |  |                      |
| CR BEST BUY Pravastatin 40 mg      | Generic                 | \$47  | 26%-34%                        |  |                      |
| <b>Rosuvastatin</b>                |                         |  |                                |  |                      |
| Rosuvastatin 5 mg                  | Crestor                 | \$176  | 39%-46%                        | Yes  | Likely               |
| <b>Simvastatin</b>                 |                         |  |                                |  |                      |
| Simvastatin 10 mg                  | Zocor                   | \$114  | 26%-33%                        | Yes  | Yes                  |
| Simvastatin 20 mg                  | Zocor                   | \$201  | 30%- 40%                       |  |                      |
| Simvastatin 10 mg                  | Generic                 | \$39  | 26%-33%                        |  |                      |
| Simvastatin 20 mg                  | Generic                 | \$69  | 30%- 40%                       |  |                      |

1. "Generic" indicates a drug sold by generic name.  
 2. Prices reflect nationwide retail average for February 2012, rounded to nearest dollar. Information derived by *Consumer Reports Best Buy Drugs* from data provided by Wolters Kluwer Pharma Solutions. Wolters Kluwer is not involved in our analysis or recommendations.  
 3. Nonfatal and fatal heart attack plus deaths attributed to heart disease.  
 4. Lovastatin has not been proven to reduce deaths but the evidence strongly points in that direction.

## If you require LDL reduction of less than 30 percent

As an example, this would mean that if you have an LDL of 170 mg/dL, your doctor might want to get it down below 130 mg/dL. Taking the evidence for effectiveness, safety, and cost into account, generic lovastatin or generic pravastatin are our *Best Buy* choices for people in this category.

The average LDL reduction you can expect with generic lovastatin is 21 to 31 percent, depending on dose. With pravastatin, it's 18 to 34 percent, and with simvastatin, it's 26 to 40 percent.

Because simvastatin is more potent, on average, than the other two drugs, your doctor might advise you to take this medicine if your LDL hovers close to 30 percent above where it should be, especially if you have a family history of heart disease and/or are overweight and sedentary.

No matter how elevated your LDL, if it doesn't decline as much as needed after a month or so, your doctor might choose to prescribe a higher dose of simvastatin, another statin, or a second cholesterol-lowering drug (such as niacin or a bile acid sequestrant) to be taken along with a statin. Bile acid sequestrants include colestevlam (Welchol), colestipol (Colestid), and cholestyramine (Questran and generic).

If you are currently taking one of the other more expensive brand-name statins and your LDL was in fact only marginally elevated when you began taking it, we suggest talking with your doctor. It might be that your health insurance or pharmacy benefit plan preferentially covers that statin. If so, you might want to stick with it if your co-payment for the drug is the lowest available under your insurance plan.

Be aware, though, that under many health insurance plans, all generics usually have a lower co-pay (usually \$5 to \$10) than brands (\$25 or more). So if you are taking a brand-name statin (Crestor, Lipitor, or Vytorin) and paying \$25 each time you fill a prescription, you could save money by switching to generic lovastatin, pravastatin, or simvastatin, if your doctor agrees that those drugs are appropriate options for you. Switching to atorvastatin (the recently released generic form of Lipitor) might also be an option. But

as previously mentioned, generic atorvastatin will likely cost about the same as brand-name Lipitor until May 2012. At that point, the generic price is expected to drop as more manufacturers are permitted to launch their generic formulations of the drug.

## If you require LDL reduction of 30 percent or more and/or have heart disease or diabetes

For example, if your total cholesterol is 220 mg/dL, your LDL is 175 mg/dL, and you have diabetes and other risk factors for heart disease, your doctor might set a target LDL for you of 100 mg/dL. That's a 43 percent decline in your LDL and will require you to take a more potent statin.

Table 4 on the next page presents your statin options if you are in this category. Taking the evidence for effectiveness, safety, and cost into account, we have chosen generic simvastatin (20 mg, 40 mg) as the *Best Buy* drug.


Simvastatin is a proven medicine with a long track record. The 20 mg and 40 mg doses reduce LDL by 30 percent to 45 percent and have been shown to reduce heart attacks and death from heart disease. The drug is on most if not all insurance company, health plan (HMO, PPO) and government (Medicare Part D) drug formularies.










If you are still taking Zocor, the brand-name version of simvastatin, talk with your doctor about switching to the generic.

If you are taking any other statin, we suggest talking with your doctor about whether you should stay on it or switch to simvastatin. For most people, switching might be a good idea. But for some it will not be. In particular, if you are one of the 10 percent of people with high cholesterol whose LDL is very high (50 percent or more than it should be), your doctor might recommend staying on the statin you are on, for example, Lipitor or Crestor. This may be a better strategy than taking the highest (80 mg) dose of simvastatin, which some studies indicate carries a higher risk of muscle problems.

In addition, if you are now taking the 40 mg or 80 mg strength of Lipitor or the 20 mg or 40 mg strength of Crestor and you switch to the 40 mg simvastatin

### Table 4. Statin Choices for Higher Risk People

**Note:** If the price box contains a , that indicates the dose of that drug is likely available for a low monthly cost through programs offered by large chain stores. For example, Kroger, Sam's Club, Target, and Walmart offer a month's supply of selected generic drugs for \$4 or a three-month supply for \$10. Other chain stores, such as Costco, CVS, Kmart, and Walgreens, offer similar programs. Some programs have restrictions or membership fees, so check the details carefully for restrictions and to make sure your drug is covered.

| Generic Name And Dose Per Day   | Brand Name <sup>1</sup> | Average Monthly Cost <sup>2</sup>  | Average Expected LDL Reduction | Reduces the Risk of Heart Attack? <sup>3</sup> | Mortality Reduction? |
|---|-------------------------|--|--------------------------------|--|----------------------|
| <b>Atorvastatin</b>   |                         |  |                                |  |                      |
| Atorvastatin 20 mg  | Generic                 | \$153  | 42%-46%                        | Yes  | Yes                  |
|  Atorvastatin 40 mg  | Generic                 | \$157  | 47%-51%                        |  |                      |
|  Atorvastatin 80 mg  | Generic                 | \$160  | 46%-54%                        |  |                      |
| Atorvastatin 20 mg  | Lipitor                 | \$191  | 42%-46%                        |  |                      |
| Atorvastatin 40 mg  | Lipitor                 | \$199  | 47%-51%                        |  |                      |
| Atorvastatin 80 mg  | Lipitor                 | \$209  | 46%-54%                        |  |                      |
| <b>Fluvastatin</b>  |                         |  |                                |  |                      |
| Fluvastatin sustained-release 80 mg   | Lescol XL               | \$189  | 35%                            | Likely   | Likely               |
| <b>Lovastatin</b>   |                         |  |                                |  |                      |
| Lovastatin 80 mg <sup>4</sup>   | Generic                 | \$108   | 39%-48%                        | Yes  | Likely <sup>5</sup>  |
| Lovastatin sustained-release 60 mg  | Altoprev                | \$507  | 40%                            |  |                      |
| <b>Pravastatin</b>  |                         |  |                                |  |                      |
| Pravastatin 80 mg   | Pravachol               | \$207  | 30%-37%                        | Yes  | Yes                  |
| Pravastatin 80 mg   | Generic                 | \$72  | 30%-37%                        |  |                      |
| <b>Rosuvastatin</b>   |                         |  |                                |  |                      |
| Rosuvastatin 10 mg  | Crestor                 | \$174  | 43%-50%                        | Yes  | Likely               |
| Rosuvastatin 20 mg  | Crestor                 | \$176  | 52%-55%                        |  |                      |
| Rosuvastatin 40 mg  | Crestor                 | \$174  | 55%-60%                        |  |                      |
| <b>Simvastatin</b>  |                         |  |                                |  |                      |
| Simvastatin 20 mg   | Zocor                   | \$201  | 30%-40%                        | Yes  | Yes                  |
| Simvastatin 40 mg   | Zocor                   | \$198  | 35%-45%                        |  |                      |
| Simvastatin 80 mg   | Zocor                   | \$206  | 40%-50%                        |  |                      |
|  Simvastatin 20 mg | Generic                 | \$69  | 30%-40%                        |  |                      |
|  Simvastatin 40 mg | Generic                 | \$69  | 35%-45%                        |  |                      |
| Simvastatin 80 mg   | Generic                 | \$63  | 40%-50%                        |  |                      |
| <b>Ezetimibe/simvastatin<sup>6</sup></b>  |                         |  |                                |  |                      |
| Ezetimibe/simvastatin 10 mg/10 mg   | Vytorin                 | \$157  | 46%                            | No   | No                   |
| Ezetimibe/simvastatin 10 mg/20 mg, 10 mg/40 mg, or 10 mg/80 mg                                      | Vytorin                 | \$153-\$156  | 31%-53%                        |  |                      |

1. "Generic" indicates a drug sold by generic name.
2. Prices reflect nationwide retail average for February 2012, rounded to nearest dollar. Information derived by *Consumer Reports Best Buy Drugs* from data provided by Wolters Kluwer Pharma Solutions. Wolters Kluwer is not involved in our analysis or recommendations.
3. Nonfatal and fatal heart attack plus deaths attributed to heart disease.
4. Requires taking two 40 mg tablets.
5. Lovastatin has not been proven to reduce deaths but the evidence strongly points in that direction.
6. Two studies cast doubt on the benefits of this drug. The first was a two-year study that found that Vytorin was no better than simvastatin alone in reducing plaque buildup in arteries. The second was a five-year study that found that Vytorin did not reduce heart attacks or strokes compared to placebo.

tablet, your LDL could rise. The increase might be minor. Your personal medical and financial circumstances should determine your choice in this case.

A switch to simvastatin could save you thousands of dollars over the many years you may have to take a statin. For example, for people with health insurance plans that require a co-pay of \$25 for a brand-name drug, such as Crestor, vs. a \$7 co-pay for generic simvastatin, that represents an \$18 difference, which amounts to a savings of \$216 per year, or \$1,080 over 5 years. For people who are without health insurance or drug coverage, the savings would be much more.

### If you have had a heart attack or have acute coronary syndrome

People who have already suffered from a heart attack are at very high risk of another (possibly fatal) heart attack and generally benefit from lowering their LDL cholesterol as much as possible. The same goes for people with acute coronary syndrome, or ACS.

People who have had a heart attack and people with ACS will probably be prescribed several different kinds of drugs, including a statin, and lifestyle changes will be strongly urged. If their LDL is not highly elevated, a doctor might choose to prescribe simvastatin 20 mg.

One notable recent study yielded favorable results for simvastatin 20 mg in preventing second heart attacks and deaths; it was compared with 80 mg of Lipitor. However, heart patients taking Lipitor fared well in that study, too (as they have in other studies), especially when it came to reducing strokes and major heart problems. In addition, atorvastatin (Lipitor and generic) may be a better option for people who have had a heart attack or have ACS and need greater LDL reduction.

Thus, for people in this category, we choose both generic simvastatin and generic atorvastatin as *Best Buys*. If you pay for drugs out of pocket, generic atorvastatin is less expensive than the brand-name version, Lipitor. However, if you have private insurance or Medicare Part D, your co-pay for Lipitor might actually be less than for the generic. So check with your insurance to figure out your out-of-pocket cost. The generic should become substantially less expen-

sive in May 2012 when more generic manufacturers launch their versions of the drug.

### Vytorin and other fixed drug combinations

Vytorin contains simvastatin in combination with ezetimibe, another type of cholesterol-lowering drug that works differently than a statin. Ezetimibe reduces LDL cholesterol by inhibiting the absorption of dietary cholesterol. Vytorin is a potent LDL reducer and has been heavily advertised to consumers. But there is no evidence that Vytorin works better than other potent statins, including generic simvastatin alone, in preventing heart attacks or strokes. In fact, a comprehensive review of the literature found that, although it has been on the market for several years, Vytorin has no demonstrated advantage over using a high-potency statin. And two recent studies cast doubt on the benefits of the drug. The first was a two-year study that showed Vytorin was no better than simvastatin alone in reducing plaque buildup in arteries. The second was a five-year study that showed Vytorin did not reduce heart attacks or strokes compared to a placebo, and more alarmingly was associated with a higher incidence of cancer and death from cancer.

### What about the other statins?

What about the other statins? As you can see in Table 4, sustained-release fluvastatin (Lescol XL) and rosuvastatin (Crestor) are priced in the same range as Vytorin. Lescol delivers less LDL lowering and has not been clearly proven to reduce heart attacks and deaths. Crestor delivers a greater reduction in LDL, and while it has been shown to reduce heart attacks and deaths, the absolute reduction in risk was small. Longer trials are needed to confirm these benefits of Crestor.

Simcor, an extended-release combination of simvastatin and niacin, has been associated with an increase in adverse events that cause people to stop taking the drug compared with those who took simvastatin alone.

### Warning about high doses

There is one other important issue you should know about as you and your doctor choose a statin. For people who are at high risk of heart attack—for example, if you have diabetes, are a smoker and have elevated LDL

levels—recent studies indicate that the lower your LDL, the lower the risk of heart attack and stroke. Since higher doses of statins reduce LDL cholesterol more than lower doses, the hypothesis has been that higher doses are better and should be used more liberally.

But other research has confused this picture. In one notable study involving people who had suffered a heart attack, high doses of Lipitor (80 mg) did not yield a lower incidence of second heart attacks or death when compared to a low dose (20 mg) of simvastatin.

In addition, higher doses come with more risks. Higher doses of all statins have been linked to muscle aches, soreness, tenderness, or weakness. Studies indicate that between one in 20 to one in 10 people who take a statin—regardless of dose—experience these symptoms, and up to 10 percent in some studies have not been able to tolerate an 80 mg dose.

Higher doses have also been linked to an increased risk of a life-threatening form of muscle breakdown called rhabdomyolysis. This can lead to permanent kidney damage, coma, and death.

We advise caution with statin dosing. In general, you should take the lowest dose necessary to meet your LDL target, even if you need to lower your LDL by 30 percent or more. People who have been diagnosed with heart disease, and especially those who have had a heart attack, may be advised to start with a

higher dose (40 mg or 80 mg) and be carefully monitored for the occurrence of side effects.

### A word about strokes

Several statins—atorvastatin, pravastatin, simvastatin, and rosuvastatin (Crestor)—have been proven to prevent strokes. The statins are also widely prescribed for people who have had a stroke or “mini-stroke,” which doctors call a transient ischemic attack, or TIA. But the evidence has never been as strong as for people with heart disease and those who have had a heart attack.

One study, for example, yielded mixed results. It found that people who had a stroke or TIA and took a statin (the drug used in the study was Lipitor) had a decreased risk over five years of a subsequent stroke or TIA. But the decline in risk was quite small: 11.2 percent of the patients that took Lipitor had another stroke or TIA versus 13.1 percent of patients who took a placebo.

In addition, the patients who took Lipitor were substantially more likely to have the kind of stroke that involves bleeding in the brain, also called a hemorrhagic stroke. This kind of stroke is less common than so-called ischemic strokes, which are caused by blood clots. But hemorrhagic strokes are much more likely to be severe, lead to greater long-term disability, and to death.

**Table 5. Statin Choices for People With Special Considerations**

| Condition or Other Drugs You May Be Taking                                | Frequently Recommended Statins <sup>1</sup>   | Comment  |
|---|---|--|
| Kidney transplant patients taking cyclosporine                            | Fluvastatin (Lescol)<br>Pravastatin (Pravachol and generic)                                       | Both are safe and effective. Lescol is less proven than pravastatin.   |
| HIV positive patients taking protease inhibitors <sup>2</sup>             | Atorvastatin (Lipitor and generic)<br>Fluvastatin (Lescol)<br>Pravastatin (Pravachol and generic) | Low doses are strongly advised.  |
| Patients taking gemfibrozil (Lopid) (a type of cholesterol-lowering drug) | Atorvastatin (Lipitor and generic)  | Gemfibrozil combined with a statin increases the risk of rhabdomyolysis, which can lead to kidney failure and death. |
| Patients taking the blood thinner warfarin (Coumadin and generic)         | All statins   | May require adjustment in dose of warfarin.  |

1. Because they have been shown effective in this population of patients.

2. Protease inhibitors include indinivir, nelfinavir, ritonavir, saquinavir, amprenavir, and the combination drug lopinavir/ritonavir.

**Table 6. Pill Splitting Could Save You Money<sup>1</sup>**

| Statin and Daily Dose        | Average Monthly Cost <sup>2</sup> | Monthly Savings if Larger Dose Split in Half | Resulting Average Monthly Cost with Split |
|------------------------------|-----------------------------------|--|---|
| Atorvastatin (generic) 20 mg | \$153                             | \$75   | \$78                                      |
| Atorvastatin (Lipitor) 10 mg | \$139                             | \$44   | \$95                                      |
| Atorvastatin (Lipitor) 40 mg | \$199                             | \$95   | \$104                                     |
| Lovastatin (generic) 10 mg   | \$12                              | \$2  | \$10                                      |
| Pravastatin (generic) 10 mg  | \$34                              | \$18   | \$16                                      |
| Simvastatin (generic) 20 mg  | \$69                              | \$35   | \$34                                      |

1. In 3rd column—monthly savings—calculation is based on cost of pill that is twice the strength of pill strength indicated in first column. For example, cost savings for a 20 mg daily dose would be based on cost of 40 mg pill, which would be split in half, compared with cost of 20 mg pill.

2. Prices reflect nationwide retail average for February 2012, rounded to nearest dollar.

Notably, the patients in the study took 80 mg of Lipitor, the highest dose. This led to speculation that the high dose may have increased the risk of hemorrhagic stroke. But that conclusion is uncertain. If you or someone you care for has had a stroke while taking any statin, consult with your doctor about the results of this study.

### People with special considerations

Table 5, on page 16, presents statin recommendations for people who take medications for certain medical conditions. If you have one of these conditions, you should discuss it with your doctor so he or she can help you determine which statin is safest and most effective for your situation.

In particular, medicines for HIV and AIDS and those used to prevent the rejection of transplanted organs can increase the toxicity of statins. Statins can also increase the effect of blood thinners, such as warfarin (Coumadin and generic), and can interact with many other medications, including those used to control blood pressure.

This is not a comprehensive list. Your doctor may advise a particular statin if you have other conditions or chronic diseases. It's wise to tell your doctor about any prescription or nonprescription medicine and dietary supplements you are taking, as well as any medical conditions you have. And you should always carefully read the labeling or package insert that comes with your medicine. It contains essential

information about how to take the medication and side effects and drug interactions you should be aware of.

### Splitting your statin pills

There is another way you can save money if you have to take a statin: Split your pills. As you can see from Tables 3 and 4, some statins cost more at higher doses but others cost the same. When larger doses cost the same as the smaller dose, you can save a lot of money by getting the larger dose and splitting the pills in half.

Several studies indicate that most statins can be split in half without any loss of effectiveness. Both government and private-sector health facilities (including the Veteran's Affairs health system) accept—and in some cases even encourage—this practice.

You should, however, consult your doctor before splitting your statin pills. Some people find pill splitting difficult to do.

If you and your doctor agree that you can split your pills, use a pill splitter to make certain that the two halves are the same size and therefore provide the correct dose each day. Pill splitter devices cost \$3 to \$10 and are widely available. A good practice is to split your pills one at a time and take the second half as your next dose. For a guide to safe and effective pill splitting, go to [www.CRBESTBUYDRUGS.org](http://www.CRBESTBUYDRUGS.org).

## The Evidence

*This section presents more information on the effectiveness and safety of statins.*

### How Effective Are Statins?

Statins reduce the risk of a first heart attack and repeat heart attacks, as well as the risk of death from heart attacks and other forms of heart disease. But some have been studied more extensively than others in terms of both their effectiveness and their safety. And ongoing research continues to define how the statins work and how they differ.

Generally, three criteria are used to measure the effectiveness of statins:

- Reduction of nonfatal heart attacks
- Reduction of deaths from heart attacks
- Reduction of death from other causes, including stroke and other forms of heart disease

### Reduction of Heart Attacks

Four statins—atorvastatin (Lipitor and generic), lovastatin (Altoprev, Mevacor, and generic), pravastatin (Pravachol and generic), and simvastatin (Zocor and generic)—have been proven to reduce the risk of heart attack over three to five years of use. And rosuvastatin (Crestor) has been shown to reduce the risk of heart attack over 1.9 years of use. But you should know that the longest studies have only looked at several years of use and no studies have looked at the impact of taking these drugs for 20 to 30 years or longer, the length of time that many people will wind up taking the medicines.

The evidence for heart-attack prevention is less definitive for fluvastatin (Lescol and Lescol XL).

Studies of Vytorin have not demonstrated that it reduces the risk of heart attack. FDA's approval of Vytorin was granted on the basis that its two active components—ezetimibe and simvastatin—have been separately evaluated. Simvastatin has been shown

to reduce heart attacks in clinical trials. But ezetimibe has not, and combinations of drugs do not always have as much benefit as one would expect from using one or the other alone. Two recent studies cast serious doubt on the benefits of this drug. The first was a two-year study that showed Vytorin was no better than simvastatin alone in reducing plaque build-up in arteries. The second was a five-year study that showed Vytorin did not reduce heart attacks or strokes compared to placebo.

It's important to note that although statins reduce the risk of a first or a repeat heart attack, they do not completely eliminate the possibility of these conditions. In one three year study assessing prevention of a first heart attack, 5 percent of people taking a placebo had a heart attack versus 3 percent taking a statin. And another recent study found that while people who did not have cardiovascular disease, but did have one or more risk factors (and/or diabetes), benefitted from taking a statin, the reduction in risk was not dramatic. Of those taking statins, 6.3 percent had a heart attack, coronary event, or stroke versus 8.1 percent of those taking a placebo.

### Reduction of Deaths

Four statins—atorvastatin (Lipitor and generic); lovastatin (Altoprev, Mevacor, and generic); pravastatin (Pravachol and generic); and simvastatin (Zocor and generic)—have been found to reduce deaths from heart attacks among patients with a history of heart disease or risk factors for heart disease, such as diabetes and high blood pressure.

In addition, two of the statins—pravastatin and simvastatin—have been found to reduce the overall risk of dying among people considered to be at low risk of heart disease or heart attack. A major study of lovastatin has strongly suggested a similar benefit. Atorvastatin has only been tested—and found to be effective—in reducing deaths in high-risk patients. But here, too, the evidence strongly suggests that it would be effective in reducing deaths among low-risk people as well.

The JUPITER trial showed that rosuvastatin (Crestor) reduced the risk of heart attacks and death in people considered to be at low risk of heart disease or heart attack. While a decrease in heart attack, stroke and death is good news, the actual reduction was quite small. The rate of these conditions dropped from about 2.8 percent in the placebo group to 1.6 percent in those who took Crestor. In addition, the JUPITER trial was stopped early after 1.9 years. Longer trials are needed to confirm the results.

### People Who Have Had a Heart Attack

Starting a statin at the time of a heart attack or very soon after can reduce the risk of death substantially—treatment that is fast becoming routine. In an important head-to-head study of people who had a heart attack, a high dose of atorvastatin (Lipitor 80 mg) proved to be more effective in reducing the rate of premature death than a moderate dose of pravastatin (40 mg). In a second recent study, 80 mg of Lipitor reduced nonfatal heart attacks more than a 20 mg dose of simvastatin, but there was no significant difference in the number of deaths among people who took the two different drugs and doses.

### How Safe Are Statins?

Overall, statins appear to be quite safe. But they can have two important adverse effects: muscle tissue damage and liver damage. We discuss those safety concerns in more detail below.

Statins also pose a risk of type 2 diabetes. The FDA added that risk to the labeling of all statins in 2012 after reviewing several studies that had found an increased risk of elevated blood sugar levels and diabetes in people who took the medications. For example, an analysis of 13 studies published in the journal *Lancet* in February 2010 found a 9 percent increased risk of diabetes in people who used statins.

Statins can also cause memory loss, forgetfulness, and confusion. The FDA, which added this risk to the labeling of statins in February 2012, said studies and reports it has received indicate there have been rare cases of people who developed memory

loss or impairment after taking the medications. Some people developed memory problems one day after taking a statin while others did not experience any problems until they had been taking a statin for years. The memory problems, which occurred in people over the age of 50, went away when the statin was stopped.

In addition, as we previously noted, the long-term effects of taking statins for decades has not been assessed. So while these drugs appear to be relatively safe over several years of use, it's uncertain if taking the medicines for 20 to 30 years or longer raises any unique concerns.

Because of the risk for birth defects, women who are pregnant or trying to become pregnant should not take any statin drug. Women who are breast feeding should not take a statin as well.

### Muscle Tissue Damage

As we've previously noted, statins can cause muscle aches, soreness, tenderness, or weakness in up to 5 to 10 percent of people taking them. This includes people taking lower doses, although low doses (10 mg and 20 mg) are much less likely to cause problems.

The symptoms of muscle problems (liver, too) include unexplained muscle weakness or pain, feeling very tired even though you've slept well, nausea and vomiting, stomach pain, brown- or dark-colored urine, and yellowing skin. *Consult your doctor immediately if you begin to have any of those symptoms.* These symptoms usually go away within days or weeks after you stop taking the drug. But they could be signs of a rare, life-threatening form of muscle breakdown called rhabdomyolysis. This can lead to permanent kidney damage and coma. One statin, cerivastatin (Baycol), was withdrawn from the U.S. market in 2001 because it caused several deaths due to rhabdomyolysis.

Larger doses of statins raise the risk of muscle aches, weakening, and rhabdomyolysis. Taking a statin in combination with certain other drugs (gemfibrozil, niacin, and verapamil; check with your doctors for a list of others) can also significantly increase the risk of muscle damage and

rhabdomyolysis. Doses of simvastatin greater than 20 mg per day increase the risk of rhabdomyolysis when used in combination with amiodarone, a drug for treating an irregular heartbeat. The cholesterol-lowering drug ezetimibe (Zetia) has been associated with muscle aches and rhabdomyolysis when used on its own and in combination with statins.

Other factors that increase the risk of rhabdomyolysis include alcoholism, low phosphate levels, extreme exercise (such as running a marathon), and the use of illegal drugs, like cocaine, heroin, and PCP.

### Liver damage

Liver damage while taking a statin is uncommon, and when it occurs it's usually mild. Nevertheless, the FDA advises patients prescribed a statin to have liver function tests before starting treatment. Contact your doctor immediately if you develop signs of liver problems, which include unusual fatigue or weakness, loss of appetite, dark-colored urine, or your skin or whites of your eyes begin to turn yellow.

### Differences Among Statins

Overall, statins at low doses do not differ with respect to the risks of these adverse effects. Generally, people taking 10 mg or 20 mg of any of the statins are at very low risk of muscle or liver problems. But studies in recent years have raised concerns about muscle damage associated with high doses of some of the statins. For example, one recent study found that 80 mg of simvastatin caused muscle damage in nine people compared with one person in the placebo group. Three of the nine in the simvastatin group developed rhabdomyolysis. The risk of rhabdomyolysis was higher than expected, but the three patients had other risk factors for the complication. The largest study of the safety of a statin followed 8,245 people who took generic lovastatin in doses of 20 mg, 40 mg, or 80 mg for four years. The incidence of muscle and liver problems increased with increasing doses.

Most experts think—and the evidence so far strongly suggests—that all the statins have the potential to cause muscle problems at high doses. But until definitive studies are done, it is not clear whether some statins now on the market may pose more of a risk than others.

Finally, studies have found that grapefruit juice can enhance the absorption of statin drugs. While no studies have found any ill effects from this, in theory it could increase the potential for muscle and liver problems, or other minor side effects. If you are taking a statin and enjoy grapefruit juice, talk with your doctor.

### Age, Race, and Gender Differences

Women, people over age 65, and members of various ethnic groups have been under-represented in the major studies of statins. But one review of the studies suggests that the drugs are equally effective and safe in men, women, and people over age 65.

The benefits of statins are uncertain, however, in women who have very marginally elevated LDL and do not already have heart disease or other risk factors. We advise women who fall into this category to discuss this issue with their doctor. In addition to your LDL level, the discussion should also focus on your overall heart disease risk, based on whether you have other risk factors (age 55 or older, diabetes, family history of heart disease, high blood pressure, lack of exercise, overweight or obese, smoker). Bear in mind that at any particular age and LDL level, women generally have a much lower risk of heart disease than men. The NCEP guidelines recommend lifestyle changes, not statins, for low-risk women, so if your risk is low and your doctor suggests a statin, you should ask whether it's really necessary at this point in your life. This free, interactive tool can help you calculate your risk: <http://hp2010.nhlbi.nih.gov/atp/iii/calculator.asp?usertype=prof>.

And as we have previously stated, women who are pregnant, trying to become pregnant, or breastfeeding should not take any statin drug.

If you are of Asian heritage (Filipino, Chinese, Japanese, Korean, Vietnamese, or Asian-Indian), you should know that the labeling for rosuvastatin (Crestor) notes that studies have found levels of the drug that were twice as high in Asian people compared with Caucasians. The labeling advises that the dosage of the drug be adjusted accordingly for Asian people. Some advise that people of Asian heritage begin initially with a 5 mg dose.

## Talking With Your Doctor

The information we present here is not meant to substitute for a doctor's judgment. But we hope it will help you and your doctor arrive at a decision about which statin and dose is best for you, if one is warranted at all, and which gives you the most value for your health-care dollar.

Bear in mind that many people are reluctant to discuss the cost of medicines with their doctor, and that studies have found that doctors do not routinely take price into account when prescribing medicines. Unless you bring it up, your doctors might assume that cost is not a factor for you.

Many people (including physicians) think that newer drugs are better. While that's a natural assumption to make, it's not true. Studies consistently find that many older medicines are as good as—and in some cases better than—newer medicines. Think of them as "tried and true," particularly when it comes to their safety record. Newer drugs have not yet met the test of time, and unexpected problems can and do crop up once they hit the market.

Of course, some newer prescription drugs are indeed more effective and safer. So talk with your doctor about the pluses and minuses of newer vs. older medicines, including generic drugs.

Prescription medicines go "generic" when a company's patents on them have lapsed, usually after 12 to 15 years. At that point, other companies can make and sell the drug.

Generics are much less expensive than newer brand-name medicines, but they are not lesser-quality drugs. Indeed, most generics remain useful medicines even many years after first being marketed. That is why more than 60 percent of all prescriptions in the U.S. today are written for generics.

Another important issue to talk with your doctor about is keeping a record of the drugs you are taking. There are several reasons:

- First, if you see several doctors, each might not be aware of medicine the others have prescribed.
- Second, since people differ in their response to medications, it's common for doctors today to prescribe several medicines before finding one that works well or best.
- Third, many people take several prescription medications, nonprescription drugs, and dietary supplements at the same time. They can interact in ways that can either reduce the benefit you get from the drug or be dangerous.
- And fourth, the names of prescription drugs—both generic and brand—are often hard to pronounce and remember.

For all those reasons, it's important to keep a written list of all the drugs and supplements you are taking, and periodically review it with your doctors.

And always be sure that you understand the dose of the medicine being prescribed for you and how many pills you are expected to take each day. Your doctor should tell you this information. When you fill a prescription at the pharmacy, or if you get it by mail, you may want to check to see that the dose and the number of pills per day on the pill bottle match the amounts that your doctor told you.

## How We Picked the *Best Buy* Drugs

Our evaluation is based in part on an independent scientific review of the studies and research literature on statin drugs conducted by a team of physicians and researchers at the Oregon Health & Science University Evidence-Based Practice Center. This analysis reviewed 347 studies, including 225 clinical trials, 80 observational studies, and 21 systematic reviews. The analysis also included studies conducted by the drugs' manufacturers. This effort was conducted as part of the Drug Effectiveness Review Project, or DERP. DERP is a first-of-its-kind, multi-state initiative to evaluate the comparative effectiveness and safety of hundreds of prescription drugs.

The full DERP review of statins is available at <http://derp.ohsu.edu/about/final-document-display.cfm>. (Note: This is a long and technical document written for physicians.) This update of our previous statin report also relied on a recent review of combination therapies conducted for the Agency for Healthcare and Research (AHRQ) Effective Healthcare Program. It is available at <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?pageaction=displayproduct&productID=171&returnpage=>.

The monthly costs we cite were obtained from a health-care information company that tracks the sales of prescription drugs in the U.S. Prices for a drug can vary quite widely. All the prices in this report are national averages based on sales in retail outlets. They reflect the cash price paid for a month's supply of each drug in February 2012.

*Consumer Reports* selected the *Best Buy* Drugs using the following criteria. The drug had to:

- Be in the top tier of effectiveness among the seven statins
- Have a safety record equal to or better than other statins
- Have an average price for a 30-day supply that is lower than the most costly statin meeting the first two criteria

The *Consumers Reports Best Buy Drugs* methodology is described in more detail in the Methods section at [www.CRBestBuyDrugs.org](http://www.CRBestBuyDrugs.org).

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These materials were made possible by a grant from the state Attorney General Consumer and Prescriber Education Grant Program, which is funded by the multi-state settlement of consumer-fraud claims regarding the marketing of the prescription drug Neurontin.

The Engelberg Foundation provided a major grant to fund the creation of the project from 2004 to 2007. Additional initial funding came from the National Library of Medicine, part of the National Institutes of Health. A more detailed explanation of the project is available at [www.CRBestBuyDrugs.org](http://www.CRBestBuyDrugs.org).

We followed a rigorous editorial process to ensure that the information in this report and on the *Consumer Reports Best Buy Drugs* website is accurate and describes generally accepted clinical practices. If we find, or are alerted to, an error, we will correct it as quickly as possible. But Consumer Reports and its authors, editors, publishers, licenses, and suppliers cannot be responsible for medical errors or omissions, or any consequences from the use of the information on this site. Please refer to our user agreement at [www.CRBestBuyDrugs.org](http://www.CRBestBuyDrugs.org) for further information.

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