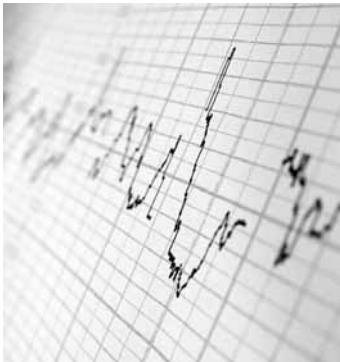


BEST BUY DRUGS



Treating High Blood Pressure and Heart Disease:
The Beta-Blockers
Comparing Effectiveness, Safety, and Price

ConsumerReportsHealth.org/BestBuyDrugs



Our Recommendations

Beta-blockers are used by tens of millions of Americans to treat high blood pressure and other heart ailments. They are effective, life-saving medicines with more than 25 years of widespread and generally safe use.

The cost of these drugs varies from less than \$10 per month to more than \$200, so your choice of medicine could mean a big difference in expense. This report, which evaluates the effectiveness, safety, and cost of 15 beta-blockers in the treatment of high blood pressure, angina (the chest pain that occurs in people with coronary artery disease), heart attack and heart failure, gives you information that could save you up to \$1,000 to \$2,000 a year if you take a generic beta-blocker instead of a brand-name one.

Taking effectiveness, safety and cost into account, we have selected the following beta-blockers, at all appropriate doses, as *Consumer Reports Best Buy Drugs*:

- *For high blood pressure* – atenolol, metoprolol tartrate, nadolol, and propranolol
- *For angina* – atenolol, metoprolol tartrate, nadolol, and propranolol
- *After a heart attack* – atenolol, metoprolol tartrate, and propranolol
- *For mild heart failure* – bisoprolol, carvedilol, and metoprolol succinate
- *For severe heart failure* – carvedilol

All of these medicines are available as low-cost generics. All have been proven to be either as effective or superior to other beta-blockers. Carvedilol has the strongest evidence of increasing survival in people with the most severe forms of heart failure. A new sustained-release, once-daily form of carvedilol called carvedilol phosphate (Coreg CR) is now available. It has the same active ingredient and, taken once a day, is expected to be as effective against severe heart failure as the immediate-release form, when taken twice daily. But Coreg CR is not yet available as a generic and it is substantially more expensive than the original form of carvedilol.

All beta-blockers are effective against high blood pressure. But because people with high blood pressure may respond to the various beta-blockers differently, you may have to try more than one before finding the drug that works best for you. Beta-blockers are considered “second step” treatment after diuretics (widely known as “water pills”) if you only have high blood pressure and no other heart condition. They are best used in combination with other blood pressure medicines in treating high blood pressure.

In contrast, if you have angina, heart failure, or if you have had a heart attack – with or without high blood pressure – our *Best Buy* beta-blockers may well be a first step treatment for you. Note: As this report goes to print in June 2009, there is a shortage of generic metoprolol succinate, so if you are unable to obtain this drug, you may have to consider one of our other *Best Buy* beta-blockers. You should discuss this with your doctor.

This information was released and last updated in June 2009.

Welcome

This report on a class of drugs called beta-blockers is part of a Consumers Union and *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've evaluated, go to ConsumerReportsHealth.org/BestBuyDrugs.

Beta-blockers are taken by tens of millions of Americans everyday. Beta-blockers were the fifth most widely prescribed class of medicines in the United States in 2008, with almost 131 million prescriptions filled. They are used primarily to treat people with high blood pressure and heart conditions. These include angina (heart or chest pain), abnormal heart rhythms, coronary artery blockages and heart failure. They are also prescribed, along with other treatments, to help prevent repeat heart attacks, to prevent migraine headaches, to treat essential tremor, to reduce performance or stage-fright anxiety, and as eye drops for glaucoma.

Fifteen beta-blockers are currently available. All but two – carvedilol phosphate (Coreg CR) and nebivolol (Bystolic) – are now available as generic drugs. Some beta-blockers are very inexpensive, costing less than \$10 per month. (See Table 3 on pages 10-13). The 15 drugs, listed below, are:

Generic Name	Brand Name(s)
1. Acebutolol	Sectral
2. Atenolol	Tenormin
3. Betaxolol	Kerlone
4. Bisoprolol	Zebeta
5. Carvedilol	Coreg, Coreg CR
6. Labetalol	Normodyne, Trandate
7. Metoprolol succinate long-acting	Toprol XL
8. Metoprolol tartrate	Lopressor
9. Nadolol	Corgard
10. Nebivolol	Bystolic
11. Penbutolol	Levatol
12. Pindolol	Visken
13. Propranolol	Inderal
14. Propranolol long-acting	Betachron, Inderal-LA, InnoPran XL
15. Timolol	Blocadren, Timolide

Beta-blockers are just one class of prescription medicines used to treat high blood pressure and heart disease. Several other classes are commonly used as well. These include diuretics, ACE inhibitors, alpha-blockers,

angiotensin-receptor blockers, and calcium-channel blockers. Those drugs plus the beta-blockers are often used in combination, two or more at a time. Indeed, many people with high blood pressure will require two or more drugs to bring their blood pressure down to a normal level.

Talk with your doctor about the right mix of blood pressure medicines for you. The discussion should also include lifestyle changes – such as eating a healthy diet, losing weight if needed, exercising, limiting alcohol use, and quitting smoking. These lifestyle changes are an important part of treatment and can reduce the need for drugs.

You should know that high blood pressure is a leading cause of death. The condition is often called the "silent killer" because it causes few, if any, symptoms until damage to the body has occurred. Because of this, it is one of the most significantly under-diagnosed and under-treated medical conditions in the U.S. If left uncontrolled, it can raise your risk of heart attack, heart failure, stroke, dementia, vision loss, and kidney failure.

High blood pressure is usually a lifelong condition. Estimates vary, but at least 65 million Americans – including a third of adults aged 18 and over – have the condition. Yet studies show that:

- 30% are *unaware* of their condition and are not getting any treatment
- 15% are aware of their condition but are not getting treatment or taking medicine
- 25% are getting treatment but their high blood pressure is *not* under control

Those figures mean that only 30% of people with high blood pressure—or more than 21 million people—are getting the medicines, care, and blood pressure control they need. In addition, high blood pressure's dangers are thought to extend to an additional *45 to 60 million* Americans who have "prehypertension," or borderline high blood pressure. (See Table 1 on page 5.)

You should have your blood pressure checked frequently – at least once a year, more often if you are over age 50, and *every time* you visit a doctor no matter what your age.

High blood pressure can occur at any age but is far more common in people age 35 and older. It is particularly prevalent in African-Americans, those with a family history of high blood pressure, people who are overweight or obese, people with diabetes, and heavy drinkers. Women taking birth control pills are also at high risk, as are people who take nonsteroidal anti-inflammatory drugs—such as ibuprofen, naproxen, and the COX-2 drug celecoxib (Celebrex)—over long periods.

This report is based on a comprehensive expert analysis of the medical evidence. There's more information on page 17 and at ConsumerReportsHealth.org/BestBuyDrugs about how we conducted our evaluation.

Note to Readers: This is one of three reports on prescription medicines to treat high blood pressure and other heart conditions. The other two reports focus on ACE inhibitors and calcium channel blockers. Sign up for an e-mail alert at our Web site ConsumerReportsHealth.org/BestBuyDrugs if you'd like us to tell you when these reports are updated or to learn about other reports posted on this Web site.



What are Beta-Blockers and Who Needs Them?

Beta-blockers work by blocking the effects of normal amounts of adrenaline on the heart and blood vessels. Adrenaline speeds up the heart rate, makes the heart muscle contract more strongly, and constricts arteries throughout the body. All these actions tend to raise blood pressure. In blocking adrenaline's effects, beta-blockers slow down the heart and reduce its workload. That helps to decrease blood pressure.

Beta-blockers are not the first choice for treating most people with high blood pressure. Recent studies indicate that inexpensive generic diuretics (such as hydrochlorothiazide or chlorthalidone) are a better initial choice. Indeed, diuretics are proven to prevent strokes and death more effectively than beta-blockers. People who are already taking a diuretic, and need a second drug to get their blood pressure down, often benefit from a beta-blocker.

Beta-blockers are the first choice, however, for people who have high blood pressure and one or more of the following conditions:

- Angina (chest pain due to coronary artery disease)
- A high heart rate at rest (a condition called tachycardia)
- A previous heart attack
- Heart failure (when the heart muscle weakens)
- Certain abnormal heart rhythms (arrhythmias, atrial fibrillation)
- Migraine headaches
- Glaucoma
- Gout (which can be aggravated by diuretics)

If you are taking a beta-blocker for high blood pressure, but not taking a diuretic, and if you do not have

Table 1. Blood Pressure Levels and Treatment Guidance

Blood Pressure Classification	Systolic Measure (mm Hg)	Diastolic Measure (mm Hg)	General Treatment Guidance
Normal	Below 120	Below 80	<ul style="list-style-type: none"> ■ No treatment needed ■ Healthy lifestyle encouraged to maintain normal blood pressure
Prehypertension	120-139	80-89	<ul style="list-style-type: none"> ■ Lifestyle changes needed: weight loss, quitting smoking, low-salt and low-fat diet, moderate alcohol use, and increased exercise ■ Drug treatment not needed except if you have diabetes, kidney or heart disease
Stage 1 High Blood Pressure	140-159	90-99	<ul style="list-style-type: none"> ■ Lifestyle changes needed, same as above ■ Drug treatment needed. Doctor may start with one medicine to see if it works
Stage 2 High Blood Pressure	160 and above	100 or above	<ul style="list-style-type: none"> ■ Contact your doctor immediately ■ Drug treatment needed. Two or more medicines usually required to bring blood pressure down ■ Lifestyle changes, as described above, are a critical component of your treatment

Source: Chobanian AV, Bakris GL, Black HR, et al., "The seventh report of the Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure," *Journal of the American Medical Association*, 2003; 289(19):2560-2572

heart disease or one of these conditions, talk to your doctor about whether a diuretic would be a better choice.

Finally, if you have asthma or chronic obstructive pulmonary disease (COPD), you should be taking a beta-blocker with extreme caution under a doctor's watchful eye. The drugs can exacerbate these conditions.

However, the benefit of taking a beta-blocker after a heart attack is so great that it usually outweighs the risk in people who have mild asthma or COPD.

People who have peripheral vascular disease, Raynaud's disease, diabetes, hay fever, chronic bronchitis, emphysema, or kidney disease should also take beta-blockers with caution.

The Basics on High Blood Pressure

Americans' health could be markedly improved if they were more alert to the dangers of high blood pressure and the need to have their blood pressure checked regularly.

Blood pressure is the force exerted upon the walls of the arteries when blood is pumped out of the heart. It's measured in millimeters of mercury (abbreviated as mm Hg) and the measurement consists of two numbers. One number, usually given first, is the pressure when the heart contracts. That's called the systolic pressure. The second number is the pressure when the heart is at rest. That's called the diastolic pressure. Your doctor may say or present them, for example, as "120 over 80" or 120/80 mm Hg.

Both the systolic and diastolic pressure are important. High blood pressure – the causes of which are not well understood – is defined, for adults, as a systolic pressure of 140 mm Hg or greater and/or a diastolic pressure of 90 mm Hg or greater. Normal blood pressure is defined as a systolic reading of less than 120mm Hg and a diastolic reading of less than 80 mm Hg.

That leaves a gap between "normal" and "high." If your blood pressure level falls into that gap, the condition is called "prehypertension." Based on recent studies, if your blood pressure is in this gap, you are at risk of developing high blood pressure and you already have some elevated risk of heart disease and stroke. So, it's important for your health to lower your blood pressure. Table 1, on page 5, presents these levels of blood pressure and general treatment guidance. If your blood pressure levels are prehypertensive and you have heart disease, kidney disease, or diabetes, you may need drug treatment to lower your blood pressure.

Note: Both numbers – systolic and diastolic – don't have to be high at the same time, and often are not. Even if only one is elevated, you are considered to have high blood pressure. Indeed, in people aged 50 and over, a high systolic reading appears to be much more strongly linked to a higher risk of heart disease and heart attack than a high diastolic blood pressure reading.

High blood pressure's relationship to stress, anxiety, nervousness, or feeling tense is often misunderstood. Feeling excited, anxious, or fearful can indeed raise blood pressure, but usually only temporarily – due to the surge of adrenaline that often accompanies these feelings. (That's why beta-blockers are sometimes prescribed to people who get anxious before performances or public speaking. They block the adrenaline rush that causes a racing heart, sweating, dizziness, and feelings of mental disorientation.) But those are not symptoms of high blood pressure. Even if you are a calm, relaxed person who never gets anxious or fearful, you can still have high blood pressure. And you will probably not have any indications that anything is wrong. Most of the time, people don't have any noticeable symptoms when their blood pressure is high, so the only reliable way to detect the condition is to have your blood pressure checked regularly using a blood pressure arm cuff (go to ConsumerReportsHealth.org for more information and Ratings of blood pressure monitors).

Choosing a Beta-Blocker – Our *Best Buy* Picks

Choosing a beta-blocker, and its dosage, depends on what you need it for. Studies show that some beta-blockers are more effective and safer than other health problems for certain conditions. If you have two or more of the conditions we discuss below, or others, your doctor will make a judgment call about which beta-blocker is best for you.

The information in this report will enable you to talk with your doctor about which drug and dosage is best and safest depending on your health status, and which may also cost you the least amount of money out of pocket.

People respond to the various beta-blockers differently. So you may have to try more than one if your doctor judges that the one you initially took is not working well.

In addition, beta-blockers have some annoying side effects – such as fatigue and drowsiness. And they can also cause, less commonly, lowered sex drive, erectile dysfunction, disturbing dreams, cold hands and feet, and mild depression. In some studies, 10% to 20% of people starting on a beta-blocker for the first time had to stop taking it because they could not tolerate the side effects.

For that reason, you should talk with your doctor about starting with a low dose of a beta-blocker. It is common for initial therapy to be the lowest dose possible. But while there are generally accepted guidelines on beta-blocker dosing, many doctors have their own ideas about the best dose to start with in different groups of patients.

Higher doses raise the risk of side effects, but a particular drug may also be more effective. So, if you need to take a beta-blocker – especially if you will be doing so for years – it may be a balancing act to find the dosage that works best but which also has the fewest side effects. And that dosage may change over time.

Taking effectiveness, safety, and cost into account, we have selected the following beta-blockers, at all listed doses, as *Consumer Reports Best Buy Drugs*:

- *For high blood pressure* – atenolol, metoprolol tartrate, nadolol, and propranolol
- *For angina* – atenolol, metoprolol tartrate, nadolol, and propranolol
- *After a heart attack* – atenolol, metoprolol tartrate, and propranolol
- *For mild heart failure* – bisoprolol, carvedilol, and metoprolol succinate
- *For severe heart failure* – carvedilol

All of these medicines are available as low-cost generics. (See Table 3 on pages 10 - 13.) All have been proven to be either just as effective or superior to other beta-blockers. Carvedilol has the strongest evidence of improving survival in people with severe heart failure as discussed below.

Treating high blood pressure. All 15 beta-blockers are effective in lowering blood pressure in people who only have high blood pressure and no other form of heart disease. All 15 are approved by the Food and Drug Administration to treat high blood pressure. No beta-blocker has been shown more effective at lowering blood pressure than any other when used as either a treatment alone or in combination with other blood pressure medicines.

All the beta-blockers are strongly *presumed* to reduce your risk of coronary heart disease, heart attack, and stroke if you have high blood pressure. Unfortunately, studies of the long-term effects of any beta-blocker on the rate of first heart attacks or deaths in people with *only* high blood pressure have yielded confusing results. Because of that, their effect on first heart attack or death remains uncertain. Nor can one beta-blocker be compared to any other in terms of their effect on reducing the risk of recurrent heart attack, stroke, and death.

So, if you have high blood pressure but no other heart condition, any beta-blocker may help, probably in combination with another type of high blood pressure drug (most likely a diuretic).

Given the above, our choice of four *Best Buy* beta-blockers for high blood pressure – **atenolol, metoprolol**

tartrate, nadolol, and propranolol – is based on price. All are relatively low-cost generics. Since the beta-blockers are not proven to be any different in effectiveness, there is no reason not to take the least expensive one.

Treating Angina. Five beta-blockers – atenolol, metoprolol tartrate, metoprolol succinate, nadolol, and propranolol – are approved by the FDA to treat angina, the chest pain that occurs in people with coronary artery disease. Acebutolol is also commonly used to treat angina. All are effective in reducing symptoms and enhancing tolerance to exercise and exertion, such as walking long distances and climbing stairs. They are also prescribed to help prevent a heart attack.

There are no differences among these five beta-blockers in reducing angina symptoms. And studies conducted to date were generally too small to determine whether there are important differences between the drugs overall in the long run.

Two beta-blockers we discuss in this report should *not* be used to treat angina: penbutolol, and pindolol. These medicines reduce heart rate less than other

beta-blockers, a distinct disadvantage in treating angina.

We have chosen four of the five indicated beta-blockers as *Best Buy* drugs, based on price. They are **atenolol, metoprolol tartrate, nadolol, and propranolol**. Generic acebutolol is substantially more expensive than these four, and no more effective.

After a heart attack. Taking a beta-blocker after a heart attack lowers the risk of a repeat attack and death by 15% to 25%. It has become a standard of care for most heart attack victims. Five beta-blockers – atenolol, carvedilol, metoprolol tartrate, propranolol, and timolol – have been proven in studies to reduce deaths in people who have had heart attacks.

The evidence is somewhat stronger for **atenolol, metoprolol tartrate, and propranolol**, however. Studies of carvedilol, while more recent, involved the use of another type of heart drug, which makes it difficult to determine just how effective carvedilol is on its own. The same goes for the newer, once-daily form of carvedilol (Coreg CR). This drug has been proven to work in the body in the same way as carvedilol, but it hasn't yet been proven to reduce

Table 2. Effectiveness of Beta-Blockers Against Specific Heart Conditions

Generic Name	Brand Name(s)	Treating Angina	After a Heart Attack	Treating Heart Failure
Acebutolol	Sectrol	Yes		
Atenolol	Tenormin	Yes	Yes	
Betaxolol	Kerlone			
Bisoprolol	Zebeta			Yes
Carvedilol	Coreg		Yes	Yes
Carvedilol phosphate	Coreg CR			
Labetalol	Normodyne, Trandate			
Metoprolol succinate	Toprol XL	Yes		Yes
Metoprolol tartrate	Lopressor	Yes	Yes	
Nadolol	Corgard	Yes		
Penbutolol	Levatol			
Pindolol	Visken			
Propranolol	Inderal	Yes	Yes	
Timolol	Blocadren		Yes	

deaths, on its own, in a large study. On that basis, and because they are available at lower cost than carvedilol, carvedilol phosphate (Coreg CR) and timolol, we have chosen **atenolol**, **metoprolol tartrate**, and **propranolol** as *Best Buy* beta-blockers for people who have had a heart attack.

Treating heart failure. Three beta-blockers – bisoprolol, metoprolol succinate, and carvedilol – have been proven to reduce deaths by about 30% and improve quality of life in people who have heart failure. Metoprolol tartrate has been proven to slow the progression of heart failure but it has no effect on deaths. For that reason, we exclude its consideration in the treatment of heart failure.

Heart failure occurs when the heart begins to lose its ability to contract and pump blood efficiently. It is a chronic disease that afflicts mostly seniors and usually gets worse over time. But it can be managed well with various drugs, usually in combination. This includes beta-blockers.

The beta-blockers listed above have different effects in people who have heart failure. Because people with heart failure are at high risk of complications, treatment with a beta-blocker must be monitored carefully by a doctor, usually a cardiologist. Your medical condition and your doctor's experience with particular beta-blockers will likely be an important factor in his or her choice among these four drugs.

Carvedilol, carvedilol phosphate (Coreg CR), and metoprolol succinate are all approved by the FDA for treating heart failure. Generic bisoprolol is also

effective for treating heart failure but it is used less often because it is not approved for this condition by the FDA. As for carvedilol phosphate (Coreg CR), its FDA approval for treating heart failure is based only on proven "bioequivalence" to immediate-release carvedilol. Bioequivalence means that two drugs with identical ingredients, such as carvedilol and carvedilol phosphate, are automatically presumed to have the same health benefits (therapeutic equivalence) after having been proven to show similar absorption curves in test subjects. We've eliminated carvedilol phosphate (Coreg CR) from consideration for treating heart failure because it hasn't been shown to be more effective than the other beta-blockers. And since it's so new, carvedilol phosphate (Coreg CR) is not available as a generic and costs significantly more than the other three beta-blockers.

Taking effectiveness, safety, and cost into account, for most people with mild to moderate heart failure, **bisoprolol**, **carvedilol**, and **metoprolol succinate** are proven and cost effective choices, and we have selected them as *Best Buy* drugs for such patients. Note: As this report goes to print, there is currently a shortage of the generic version of metoprolol succinate. If you are unable to obtain this drug, you may want to consider one of our other *Best Buy* picks. You should discuss with your doctor which drugs are most appropriate for you and your condition.

Additionally, **carvedilol** has the strongest evidence of effectiveness in the treatment of people with severe heart failure. So, on that basis, we have chosen it as our *Best Buy* drug for such patients as well.

Table 3. Beta-Blocker Cost Comparison and *Best Buy* Indication










Beta-blocker name, dosage strength and form	Brand name	Daily dosage frequency ¹	Total daily dosage	Average monthly cost ²	<i>Best Buy</i> Indication
Acebutolol 200 mg	Generic ³	One	200 mg	\$21	
Acebutolol 200 mg	Sectral	One	200 mg	\$123	
Acebutolol 400 mg	Generic	One	400 mg	\$29	
Acebutolol 400 mg	Sectral	One	400 mg	\$135	
Acebutolol 400 mg	Generic	Two	800 mg	\$58	
Acebutolol 400 mg	Sectral	Two	800 mg	\$270	
Acebutolol 400 mg	Generic	Three	1200 mg	\$87	
Acebutolol 400 mg	Sectral	Three	1200 mg	\$405	
 Atenolol 25 mg	Generic	One	25 mg	\$6	Angina, heart attack, high blood pressure
Atenolol 25 mg	Tenormin	One	25 mg	\$67	
 Atenolol 25 mg	Generic	Two	50 mg	\$12	Angina, heart attack, high blood pressure
Atenolol 25 mg	Tenormin	Two	50 mg	\$134	
 Atenolol 50 mg	Generic	One	50 mg	\$6	Angina, heart attack, high blood pressure
Atenolol 50 mg	Tenormin	One	50 mg	\$62	
 Atenolol 50 mg	Generic	Two	100 mg	\$12	Angina, heart attack, high blood pressure
Atenolol 50 mg	Tenormin	Two	100 mg	\$124	
 Atenolol 100 mg	Generic	One	100 mg	\$8	Angina, heart attack, high blood pressure
Atenolol 100 mg	Tenormin	One	100 mg	\$98	
 Atenolol 100 mg	Generic	Two	200 mg	\$16	Angina, heart attack, high blood pressure
Atenolol 100 mg	Tenormin	Two	200 mg	\$196	
Betaxolol 10 mg	Generic	One	10 mg	\$37	
Betaxolol 10 mg	Kerlone	One	10 mg	\$61	
Betaxolol 20 mg	Generic	One	20 mg	\$52	
Betaxolol 20 mg	Kerlone	One	20 mg	No price available	
 Bisoprolol 5 mg	Generic	One	5 mg	\$39	Mild heart failure
Bisoprolol 5 mg	Zebeta	One	5 mg	\$102	
 Bisoprolol 10 mg	Generic	One	10 mg	\$39	Mild heart failure
Bisoprolol 10 mg	Zebeta	One	10 mg	\$112	
 Bisoprolol 10 mg	Generic	Two	20 mg	\$78	Mild heart failure
Bisoprolol 10 mg	Zebeta	Two	20 mg	\$224	

Table 3. Beta-Blocker Cost Comparison and *Best Buy* Indication











	Beta-blocker name, dosage strength and form	Brand name	Daily dosage frequency ¹	Total daily dosage	Average monthly cost ²	<i>Best Buy</i> Indication
	Carvedilol 3.125 mg	Generic	Two	6.25 mg	\$46	Mild and severe heart failure
	Carvedilol 3.125 mg	Coreg	Two	6.25 mg	\$164	
	Carvedilol 6.25 mg	Generic	Two	12.5 mg	\$44	Mild and severe heart failure
	Carvedilol 6.25 mg	Coreg	Two	12.5 mg	\$162	
	Carvedilol 12.5 mg	Generic	Two	25 mg	\$44	Mild and severe heart failure
	Carvedilol 12.5 mg	Coreg	Two	25 mg	\$166	
	Carvedilol 25 mg	Generic	Two	50 mg	\$44	Mild and severe heart failure
	Carvedilol 25 mg	Coreg	Two	50 mg	\$162	
	Carvedilol 10 mg SR ⁴	Coreg CR	One	10 mg	\$150	
	Carvedilol 20 mg SR	Coreg CR	One	20 mg	\$151	
	Carvedilol 40 mg SR	Coreg CR	One	40 mg	\$150	
	Carvedilol 80 mg SR	Coreg CR	One	80 mg	\$149	
	Labetalol 100 mg	Generic	Two	200 mg	\$24	
	Labetalol 100 mg	Trandate	Two	200 mg	\$58	
	Labetalol 200 mg	Generic	Two	400 mg	\$32	
	Labetalol 200 mg	Trandate	Two	400 mg	\$70	
	Labetalol 300 mg	Generic	Two	600 mg	\$44	
	Labetalol 200 mg	Generic	Four	800 mg	\$64	
	Labetalol 200 mg	Trandate	Four	800 mg	\$140	
	Metoprolol succinate 25 mg SR	Generic	One	25 mg	\$29	Mild heart failure
	Metoprolol succinate 25 mg SR	Toprol XL	One	25 mg	\$45	
	Metoprolol succinate 50 mg SR	Generic	One	50 mg	\$30	Mild heart failure
	Metoprolol succinate 50 mg SR	Toprol XL	One	50 mg	\$44	
	Metoprolol succinate 100 mg SR	Generic	One	100 mg	\$44	Mild heart failure
	Metoprolol succinate 100 mg SR	Toprol XL	One	100 mg	\$63	
	Metoprolol succinate 200 mg SR	Generic	One	200 mg	\$67	Mild heart failure
	Metoprolol succinate 200 mg SR	Toprol XL	One	200 mg	\$103	
	Metoprolol tartrate 25 mg	Generic	One	25 mg	\$4	Angina, heart attack, high blood pressure
	Metoprolol tartrate 50 mg	Generic	One	50 mg	\$4	Angina, heart attack, high blood pressure

Table 3. Beta-Blocker Cost Comparison and *Best Buy* Indication








Beta-blocker name, dosage strength and form	Brand name	Daily dosage frequency ¹	Total daily dosage	Average monthly cost ²	<i>Best Buy</i> Indication
Metoprolol tartrate 50 mg	Lopressor	One	50 mg	\$54	
 Metoprolol tartrate 100 mg	Generic	One	100 mg	\$6	Angina, heart attack, high blood pressure
Metoprolol tartrate 100 mg	Lopressor	One	100 mg	\$80	
 Nadolol 20 mg	Generic	One	20 mg	\$8	Angina, high blood pressure
Nadolol 20 mg	Corgard	One	20 mg	\$99	
 Nadolol 40 mg	Generic	One	40 mg	\$8	Angina, high blood pressure
Nadolol 40 mg	Corgard	One	40 mg	\$100	
 Nadolol 80 mg	Generic	One	80 mg	\$24	Angina, high blood pressure
Nadolol 80 mg	Corgard	One	80 mg	\$154	
 Nadolol 120 mg	Generic	One	120 mg	\$55	Angina, high blood pressure
Nadolol 120 mg	Corgard	One	120 mg	\$115	
 Nadolol 160 mg	Generic	One	160 mg	\$55	Angina, high blood pressure
Nadolol 160 mg	Corgard	One	160 mg	\$137	
Nebivolol 2.5 mg	Bystolic	One	2.5 mg	\$68	
Nebivolol 5 mg	Bystolic	One	5 mg	\$68	
Nebivolol 10 mg	Bystolic	One	10 mg	\$68	
Nebivolol 10 mg	Bystolic	Two	20 mg	\$136	
Nebivolol 10 mg	Bystolic	Three	30 mg	\$204	
Nebivolol 10 mg	Bystolic	Four	40 mg	\$272	
Penbutolol 20 mg	Levatol	One	20 mg	\$91	
Penbutolol 20 mg	Levatol	Two	40 mg	\$182	
Pindolol 5 mg	Generic	Two	10 mg	\$14	
Pindolol 10 mg	Generic	Two	20 mg	\$14	
Pindolol 10 mg	Generic	Three	30 mg	\$21	
Pindolol 10 mg	Generic	Four	40 mg	\$28	
Pindolol 10 mg	Generic	Five	50 mg	\$35	
Pindolol 10 mg	Generic	Six	60 mg	\$42	
 Propranolol 10 mg	Generic	Two	20 mg	\$8	Angina, heart attack, high blood pressure
Propranolol 10 mg	Inderal	Two	20 mg	\$34	

Table 3. Beta-Blocker Cost Comparison and *Best Buy* Indication

Beta-blocker name, dosage strength and form	Brand name	Daily dosage frequency ¹	Total daily dosage	Average monthly cost ²	<i>Best Buy</i> Indication
 Propranolol 20 mg	Generic	Two	40 mg	\$8	Angina, heart attack, high blood pressure
Propranolol 20 mg	Inderal	Two	40 mg	\$54	
 Propranolol 40 mg	Generic	Two	80 mg	\$24	Angina, heart attack, high blood pressure
Propranolol 40 mg	Inderal	Two	80 mg	\$60	
 Propranolol 60 mg	Generic	Two	120 mg	\$56	Angina, heart attack, high blood pressure
Propranolol 60 mg	Inderal	Two	120 mg	\$80	
 Propranolol 80 mg	Generic	Two	160 mg	\$32	Angina, heart attack, high blood pressure
Propranolol 80 mg	Inderal	Two	160 mg	\$98	
Propranolol 60 mg SR	Generic	One	60 mg	\$42	
Propranolol 60 mg SR	Inderal LA	One	60 mg	\$130	
Propranolol 60 mg SR	Betachron	One	60 mg	\$23	
Propranolol 80 mg SR	Generic	One	80 mg	\$48	
Propranolol 80 mg SR	Inderal LA	One	80 mg	\$145	
Propranolol 120 mg SR	Generic	One	120 mg	\$58	
Propranolol 120 mg SR	Inderal LA	One	120 mg	\$191	
Propranolol 160 mg SR	Generic	One	160 mg	\$79	
Propranolol 160 mg SR	Inderal LA	One	160 mg	\$270	
Propranolol 80 mg CD ⁵	InnoPran XL	One	80 mg	\$84	
Propranolol 120 mg CD	InnoPran XL	One	120 mg	\$85	
Timolol 5 mg	Generic	Two	10 mg	\$24	
Timolol 10 mg	Generic	Two	20 mg	\$32	
Timolol 10 mg	Generic	Three	30 mg	\$48	
Timolol 20 mg	Generic	Two	40 mg	\$46	

1. Depending on your health conditions, symptoms and response to the medicine, your doctor may adjust your dose to be either higher or lower than what we've stated in this price chart.
2. "Generic" indicates that this drug is sold by its generic name. For example, in this table, for the first drug listed, acebutolol, is the generic or chemical name and Sectral is the brand name. Both are available and they have the same active ingredient. In column 2, when the word "generic" appears, the price given is for the generic version. Note that the generic will almost always cost much less than the brand-name version.
3. Prices reflect nationwide retail average for February 2009, rounded to the nearest dollar. Information derived by *Consumer Reports Best Buy Drugs* from data provided by Wolters Kluwer Health, Pharmaceutical Audit Suite®. Wolters Kluwer Health is not involved in our analysis or recommendations.
4. "SR" stands for sustained release.
5. "CD" stands for continuous delivery.
6. All beta-blockers listed are tablets, except Acebutolol, Carvedilol sustained release and Propranolol sustained release and continuous delivery, which are capsules.

The Evidence

This section presents more detailed information on the effectiveness and safety of beta-blockers.

This report is based on an analysis of the scientific evidence on beta-blockers. More than 5,000 studies were identified that were published in peer-reviewed medical literature between the mid-1960s and early 2007. From these, the analysis focused on 114 studies. The majority of these were medium- to large-scale controlled clinical trials or detailed “meta-analyses” of multiple clinical trials. A meta-analysis study combines the results of previous individual studies and tries to draw conclusions based on all of them.

How Effective Are Beta-Blockers?

Beta-blockers are potent, highly effective medicines. Studies show them to be consistently better than a placebo in treating high blood pressure and a range of other heart conditions.

There are important differences in how the various beta-blockers work that will affect your doctor’s use of them. These differences have affected our choice of *Best Buy* drugs as well – for the various conditions specified. In the earlier sections of this report, we have avoided these complex details to prevent confusion.

Essentially, there are four subgroups among the 15 beta-blockers. One group, called the nonselective beta-blockers, equally reduce adrenaline’s impact on the heart muscle and on blood vessels, the lungs, the bladder, and the eyes. A second group, called the “cardioselective” beta-blockers, block the impact of adrenaline on the heart more than other tissues in the rest of the body. A third group has less impact on the heart itself and more on blood vessels and other tissues. And a fourth group works primarily by affecting other nerve signals entirely, primarily in blood vessels.

For example, the seven cardioselective beta-blockers are acebutolol, atenolol, betaxolol, bisoprolol, metoprolol succinate, metoprolol tartrate, and nebivolol.

Your doctor should know about these differences. And you should not hesitate to ask your doctor what kind of beta-blocker is being prescribed – and how

your doctor thinks it will act in your body. This may help you understand why you would need to continue taking the medicine even though it might not necessarily make you feel better – and could even make you feel worse.

Overall, the strongest evidence on beta-blockers links them to a lower risk of repeat heart attack and early death in the aftermath of a heart attack. More than 60 studies have examined this and all have found a marked benefit for the pills. If you or someone you care for has a heart attack, make sure you check to see if a beta-blocker is being given – and if not, why not.

Compelling evidence also documents that cardioselective beta-blockers lower the risk of death in people with heart failure, preventing 3.8 deaths per 100 patients in the first year of treatment.

In combating high blood pressure, beta-blockers are considered to be a critical “second step” or additional drug – with strong evidence of effectiveness when used in combination with other blood pressure drugs, most notably diuretics. In one landmark analysis published in 2003, beta-blockers given to people with high blood pressure were better than placebo in preventing stroke and cardiovascular disease events, including death. But, when used alone, they were inferior to low-dose diuretics in reducing the risk of these outcomes.

How Safe Are Beta-Blockers?

Beta-blockers are generally safe medicines, with more than 20 years of widespread use around the world. They have not been conclusively shown to cause any serious long-term or irreversible negative consequences, even after many years of use. But at least two studies have found that one beta-blocker—atenolol—increased the risk for developing diabetes, but both studies had methodological flaws that make their results unreliable. So while it is possible atenolol raises the risk of diabetes, the available evidence does not allow us to draw a conclusion either way.

But side effects are common among people taking beta-blockers. The majority of people can expect to

experience at least one. These include fatigue or drowsiness, dizziness or lightheadedness, slow heart-beat, low blood pressure, difficulty breathing, numbness, tingling or coldness of fingers, toes or skin, weight gain, depression, disturbing dreams, reduced libido, erectile dysfunction in men, or reduced ability to achieve an orgasm in both men and women.

Any of these should prompt a call to your doctor if it persists, especially breathing difficulties, dizziness, or fatigue. Many of these side effects are related to the dose you take – with the risk of side effects rising with dose. Your doctor may need to reduce your beta-blocker dose to see if that solves the problem. Most side effects can be avoided or minimized by starting with a low dose and increasing it gradually, if that is necessary. Also, some adverse effects go away or diminish in time, after your body gets used to the drug.

If one or more side effects persist with one beta-blocker, your doctor will likely suggest you try another one. There is no convincing evidence that any one beta-blocker produces more or less side effects than any other, but people do respond differently to the individual drugs.

Some people, however, have to stop taking any beta-blocker because they cannot tolerate the side effects. In one study of heart failure patients, one in five could not tolerate the initial beta-blocker they were

given. About half of that group was successfully switched to another beta-blocker. In other studies, the rate at which people had to stop taking a beta-blocker due to side effects was somewhat lower.

Because the symptoms of high blood pressure are often minimal or nonexistent; whereas, the drugs themselves can cause bothersome adverse effects, some people stop taking the medication. People have widely varying tolerance for side effects and you should talk to your doctor about their importance to you. In particular, the mild depression or loss of sexual desire that can occur with beta-blockers is quite unacceptable to some people but tolerable to others.

You should never stop taking a beta-blocker without consulting your doctor. This can be quite dangerous because it could worsen your condition and put you at risk of a heart attack or stroke.

Age, Race, and Gender Differences

Beta-blockers in general may be less effective in controlling high blood pressure in African-Americans. But no particular beta-blocker has been shown to be more effective or safe than any other in African-Americans or any other ethnic group. Likewise, no beta-blocker has been shown more or less useful in men versus women, or vice versa, or in any particular age group.

Talking With Your Doctor

It's important for you to know that the information we present in this report is not meant to substitute for a doctor's judgment. But we hope it will help your doctor and you arrive at a decision about which beta-blocker drug to take and what dosage is best for you.

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

Many people (including many physicians) also believe that newer drugs are always or almost always better. While that's a natural assumption to make, the fact is that it's not true. Studies consistently show 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. 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 a drug expires, usually after about 12 to 15 years from when a drug is put on the market. At that point, other companies can make and sell the drug.

Generics are almost always 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 today more than half of all prescriptions in the U.S. are 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 for this:

- First, if you see several doctors, they may not always tell each other which drugs have been prescribed for you.
- Second, it is very common for doctors today to prescribe several medicines for you before finding one that works well or best, mostly because people vary in their response to prescription drugs.
- Third, more and more people today take several prescription medications, nonprescription drugs and dietary supplements all at the same time. Many of these interact in ways that can be very dangerous.
- And fourth, the names of prescription drugs—both generic and brand—are often hard to pronounce and remember.

For all these reasons, it's important to keep a list of the drugs you are taking, both prescription and nonprescription, and include dietary supplements.

Always be sure, too, 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 were discussed with your doctor.

How We Conducted Our Review of the Beta-Blockers

Our evaluation is based in large part on an independent review of the scientific evidence on the effectiveness, safety, and adverse effects of beta-blockers. A team of physicians and researchers at Oregon Health & Science University Evidence-based Practice Center conducted the analysis. A consultant to *Consumer Reports Best Buy Drugs* is also a member of the Oregon-based research team, which has no financial interest in any pharmaceutical company or product.

The prescription drug costs we cite were obtained from a healthcare information company that tracks the sales of prescription drugs in the U.S. Prices for a drug can vary quite widely, even within a single city or town. All the prices in this report are national averages based on sales of prescription drugs in retail outlets. They reflect the cash price paid for a month's supply of each drug in February 2009.

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

- Be as effective or more effective than other beta-blockers
- Have a safety record equal to or better than other beta-blockers
- Cost roughly the same or less than other beta-blockers

The *Consumers Reports Best Buy Drugs* methodology is described in more detail in the methods section at ConsumerReportsHealth.org/BestBuyDrugs.

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Consumer Reports Best Buy Drugs[™] is a public education project administered by Consumers Union. It is partially grant funded. Principal current outside funding comes 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.

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A more detailed explanation of the project is available at ConsumerReportsHealth.org.

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