

## A Heads-up Call for Cyclists

Protect your brain with a bike helmet. We found great ones for as low as \$12.

**DO YOU NEED A BIKE HELMET?** You wouldn't think that would still be a controversial question, but it is. The anti-helmet contingent offers arguments such as: "Forcing people to wear helmets makes cycling seem dangerous." "It's inconvenient." "It discourages exercise." "More bike lanes would be better!" "No one wears them in Amsterdam."

Helmets aren't a panacea, but the answer is a resounding yes, you *should* wear a helmet. Here's why: 87 percent of the bicyclists killed in accidents over the past two decades were not wearing helmets, according to the Insurance Institute for Highway Safety. And when it comes to nonfatal injuries, a 2013 review by a committee at the Institute of Medicine found that wearing a helmet during sports reduces the risk of traumatic brain injury (TBI) by almost 70 percent.

TBI is a catchall term used to describe a spectrum of head injuries from concussions to skull fractures. Bike-helmet safety standards are designed to measure a helmet's protective-ness on the catastrophic end of the range—the realm of skull fracture, severe brain injury, and death. Of the 23 helmets we put through our impact tests, all absorbed the force of impact within the limit set by the current Consumer Product Safety Commission standard, and 22 received at least a very good rating for impact resistance in our tests.

Determining how well helmets protect against concussion—which can be serious, but not in and of itself life threatening—is trickier. The brain is a gelatinlike structure surrounded by fluid, which acts as a cushion against shock. A blow to the head or a violent movement (such as whiplash) can cause the brain to slide

or rotate inside and bump against the skull. That can disrupt the normal functioning of the brain and alter brain chemistry. You can't always "see" a concussion on a CT scan or an MRI, and there is still plenty that doctors and other experts don't know about concussions.

"There's no single objective test to determine if someone has a concussion," says Orly Avitzur, M.D., a neurologist and a medical adviser to Consumer Reports. "They're diagnosed based on symptoms and the results of a neurological exam." (See "Is It a Concussion?" on page 48.) If there's no objective test to show whether someone has a concussion, it's difficult to design a test to see whether wearing a helmet protects against one.

But the bottom line on helmets is: They work. First, there's the undisputed fact that helmets are very effective at reducing your odds of suffering a moderate or severe head injury if you fall. And though they may not protect against all concussions, because they are designed to slow the rate at which the head decelerates and to disperse and absorb the energy of an impact, chances are they help at least a little.

"The best studies done on bike helmets show that they are unequivocally effective in preventing traumatic brain injury—mild, moderate, and severe," says Frederick P. Rivara, M.D., M.P.H., vice chairman of the Institute of Medicine committee and a professor of pediatrics at the University of Washington in Seattle. "People should always wear a helmet when they ride a bike. And our studies show that when parents wear them, children do, too."

### We Gave Them a Real Pounding

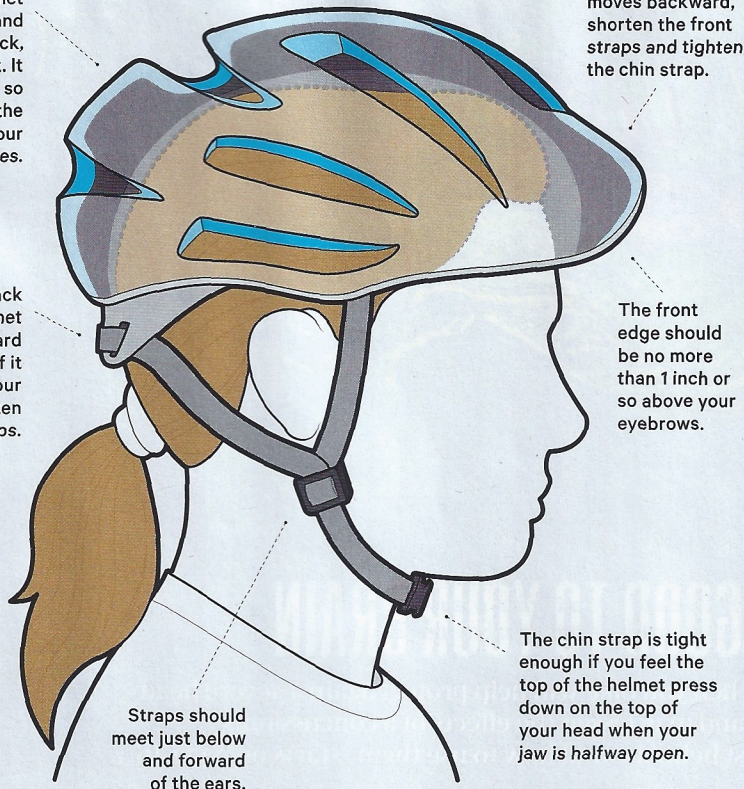
Safety is the most important factor when you're choosing a helmet. To test helmets, we put them through a brutal pounding in our labs using an apparatus that dropped them at 7 mph and 14 mph onto a flat anvil to measure how they absorbed impact. We used an electronic sensor inside a dummy metal head to detect how much force would be transmitted to a rider's head in an accident. Because you can strike your head in different places in a fall, we hit each helmet at the front, crown, back, and sides.

We also checked each helmet's ability to pass a test that evaluates the strength and holding power of the chin strap. We dropped an 8¾-pound weight 2 feet; that pulled on the helmet strap to simulate the force that might occur in an accident. We checked to see

## Get the Right Fit

Push the helmet side to side and front to back, and twist. It should move so little that the skin at your temples wrinkles.

Grab the back of the helmet and pull toward the front. If it slips over your eyes, shorten the back straps.



Push up firmly on the front edge of the helmet. If it moves backward, shorten the front straps and tighten the chin strap.

The front edge should be no more than 1 inch or so above your eyebrows.

The chin strap is tight enough if you feel the top of the helmet press down on the top of your head when your jaw is halfway open.

Straps should meet just below and forward of the ears.



## Ratings: Bike Helmets

Scores in context: Of the 16 adult bike helmets we tested, the highest scored 85; the lowest, 38. Of the seven kids' helmets, the highest scored 80; the lowest, 30. CR Best Buys blend value and performance.

☑ CR Best Buy ☑ Recommended

● Excellent ● Very Good ○ Good ● Fair ● Poor

### A. ADULT HELMETS

Rec.	Rank	BRAND & MODEL	PRICE	SCORE	TEST RESULTS	SPECS
					Impact Absorption Ventilation Fit Adjustments	Weight (lb.) Sizes Available
☑	1	Scott Arx Plus	\$150	85	● ● ●	0.60 S, M, L
☑	2	Bontrager Circuit ①	\$100	77	● ● ○	0.62 S, M, L
☑	3	Smith Forefront ②	\$220	76	● ○ ●	0.72 S, M, L
☑	4	Bell Array	\$80	76	● ● ●	0.70 S, M, L
☑	5	Lazer Cyclone ②	\$45	73	● ○ ●	0.78 S, M, L
☑	6	Specialized Echelon II	\$65	73	● ● ○	0.67 S, M, L
☑	7	Bell Piston ②	\$40	72	● ● ●	0.68 Universal
☑	8	Schwinn Merge ②	\$12	71	● ● ○	0.63 Universal
☑	9	Giro Revel ②	\$45	71	● ○ ●	0.67 Universal
	10	Poc Trabcac ②	\$150	67	● ● ○	0.75 XS-S, M-L, XL-XXL
	11	Bell Muni ②	\$65	54	● ● ●	0.73 S-M, M-L
	12	Louis Garneau Sharp	\$95	42	● ● ○	0.61 S, M, L
	13	Nutcase Street Sport ②	\$70	40	● ● ●	1.10 S, M, L
	14	Giro Reverb ②	\$60	40	● ● ●	0.60 S, M, L
	15	Bern Macon EPS w/Visor Summer ②③	\$60	38	○ ● ●	1.09 S-M, L-XL

### B. YOUTH HELMETS

☑	1	Bontrager Solstice Youth ①②	\$40	80	● ○ ●	0.57 Universal
	2	Schwinn Thrasher Youth ②	\$25	67	● ● ●	0.73 Universal
	3	Specialized Flash ②	\$40	49	● ● ●	0.70 Universal
	4	Giro Rodeo	\$30	39	● ● ●	0.59 Universal
	5	Louis Garneau Babyboomer	\$30	35	● ● ●	0.63 Universal
	6	Razor V17	\$20	35	● ● ●	0.98 Universal
	7	Raskulz Mohawk ③	\$22	30	● ● ●	0.74 3+, 5+ (S)

### DON'T BUY: SAFETY RISK

		Cannondale Teramo	\$120	-	-	-	-	0.61	S-M, L-XL
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① Manufacturer says any helmet damaged in an accident in the first year will be replaced free. ② Has a removable visor.

③ Multisport style resembles helmets used in BMX and skateboarding.



Scott Arx Plus

## Find the Best Helmet for You

### CUSTOMIZABLE FIT

- A1 Scott \$150
- A3 Smith \$220
- A4 Bell \$80
- B1 Bontrager \$40 CR Best Buy

These make it a snap to get the fit you want.

### BEST IF YOU HATE A SWEATY HEAD

- A6 Specialized \$65

### PRICEY BUT WORTH IT

- A1 Scott \$150

This one has it all—excellent impact resistance, easy fit, light weight, and very good ventilation.

### CHEAP AND SAFE

- A8 Schwinn \$12 CR Best Buy

It works, it's comfortable, and at 12 bucks, you can't go wrong.

### LIGHTWEIGHT

- A2 Bontrager \$100
- B1 Bontrager \$40 CR Best Buy

The Bontrager helmets weigh just a little more than ½ pound.

### MULTISPORT

- A15 Bern \$60

If you like to skateboard and ride a bike and don't want to buy two helmets, this is a good option, though it was one of the heaviest models in our tests.

## Don't Buy This Helmet

We rated the Cannondale Teramo helmet, \$120, a Don't Buy: Safety Risk because it failed our chin-strap strength test. The buckle snapped off or broke into pieces in four of the five samples we tested. We are not aware of any injuries related to the helmet, but a broken chin strap means a helmet might not stay in place in the event of a fall.

We contacted Cannondale to share our test results in December, and the company disputed our findings, stating that it stands by its third-party independent test results. Can-

nondale also said its helmets are "tested in accordance with the required [CPSC] protocol and have passed all testing" and that it had not received any reports of injuries. When we asked Cannondale whether the company would consider giving Teramo owners a refund or credit for the helmet, it said, "No issues with buckles or breakages exist." We attempted to contact the company again before press time, but it did not respond to our requests for comment. If you have concerns, we suggest you contact the company at 800-245-3872.



☒ Don't Buy: Safety Risk  
Cannondale Teramo helmet



whether the strap stretched too much, or broke or came loose where it is attached to the helmet, and whether the clasp or buckle remained intact. All of the helmets passed that test, except the Cannondale Teramo, which we've rated a Don't Buy: Safety Risk (see "Don't Buy This Helmet," on page 47). Because that helmet failed our chin-strap test, we did not put it through our impact test.

## It's All About the Fit

No matter how well a helmet protects, you're not going to wear it if it's not comfortable or is difficult to adjust. So we also looked at ventilation, weight, and fit adjustment. Combining the scores with those of our safety tests, the Scott Arx Plus, \$150, came out at the top of our adult helmet ratings. The Arx is equipped with a Multi-directional Impact Protection System. MIPS helmets have an inner lining that is supposed to minimize rotational force, believed to be a prime factor in TBI, and reduce the amount of energy delivered to the head.

But whether a helmet with MIPS minimizes rotational force any better than a helmet without MIPS is a matter of debate. Some experts argue that your scalp or hair functions similarly to a helmet liner and allows for slide on impact. We did not test that feature because we could not find a standard test for rotational force. We judged the Scott Arx Plus on the same features as we did for every other helmet in our tests.

By testing for impact resistance at two speeds, though, we attempted to see whether there were any differences in the helmets' performance in lower-impact accidents. A 7 mph helmet drop simulates falling 2 feet off a bike, and a 14 mph fall is like falling 7 feet. "It's not only how fast you're going—it's also the height you fall from that can have an effect on the severity of the impact," says Rich Handel, assistant test project leader for bike helmets. As you might expect, a fall from a higher height subjects your head to more force. But we didn't see any differences in performance between the two heights that would change a helmet's rating.

The top-rated bike helmet for kids is the Bontrager Solstice Youth. It didn't rate as high for ventilation as some of the others, but it got a very good score in our impact test and an excellent score for fit adjustment. At \$40 it's a CR Best Buy.

And speaking of cost, the helmets we tested ranged from \$12 to \$220. "You might find some of the more expensive models to be more stylish, but when it comes to protection and comfort, you don't need to spend a lot of money," Handel says. The \$12 Schwinn Merge adult helmet got a very good rating overall. That's a small price to pay to protect your brain.

## Stand out at Night

Reflective gear can save cyclists' lives—provided that drivers can spot them in the first place. Our testers looked at 11 reflective garments and accessories along with a dark shirt used as a control. The mission: to judge how well each could be seen in headlights after dark at 300 feet, the stopping distance for a car going 60 mph in normal road conditions.

The bright yellow **Uline safety vest**, \$15 (top left), though not so fashionable, popped the most. The **Sugoi Zap fluorescent bike jacket**, \$159 (middle left), was also easy to spot. Both the **Gore Windstopper Soft Shell jacket**, \$180 (middle right), and **Eastern Mountain Sports Velo bike jersey**, \$55 (top right), could be seen easily from the back, thanks to big reflective elements, but less so from the front. The **Betabrand reflective plaid commuter shirt**, \$59 (bottom left), was the least visible at 300 feet. Reflective and lit wrist and ankle bands had good visibility.

The **SlapLit**, \$10 (bottom right), goes into flashing mode with the push of a button. Wearing one of those accessories alone limits reflectivity to one small area of your body, so we suggest wearing one with a reflective jacket, vest, or shirt for an extra measure of safety.



Uline safety vest



Eastern Mountain Sports Velo bike jersey



Sugoi Zap fluorescent bike jacket



Gore Windstopper Soft Shell jacket



Betabrand reflective plaid commuter shirt



SlapLit

## Treat Your Bike Helmet Right

For something that protects you so solidly, a bike helmet needs to be treated with a surprising amount of TLC. Even normal handling can leave minor dents in the liner (which absorbs the impact), so be careful where you store it. When your helmet is dirty or the pads, liners, and straps start to get a little funky, use mild soapy water to clean it—harsher cleaning products can damage the shell or liner. Heat is a helmet's enemy. Don't just toss it into the trunk of your car. Many manufacturers warn against exposing it to temps above 150° F; it's not hard for the interior or trunk of a car to exceed that on a hot summer day. If a helmet is gouged or cracked—or has been involved in an accident, even if you can't see the damage—replace it.

## Is It a Concussion?

If you fall and hit your head but seem to be OK, you still should pay close attention to how you feel over the next few hours or days. The symptoms of concussion vary and range from mild to severe. If you experience any of the following after a jolt to the head, play it safe and call your doctor or go to the emergency room.

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or sound
- Feeling sluggish, hazy, foggy, or sleepy
- Confusion or trouble concentrating
- Memory problems