



## Ask Dr. Spoke

*Dear Dr. Spoke: When or how often should I replace my bike helmet?*

*Save the Noggin'*

Dear Noggin,

Very good question, and before I answer we should understand what helmets provide. Traditional helmets provide direct impact protection achieved through a crushing material like Styrofoam. The material absorbs and mitigates the impact energy. These helmets likely feature a hard plastic shell more to provide incidental abrasion protection for the crush material. The shell does not add to the fundamental protection: concussion/skull fracture.

We next move to fit. The helmet should be snug, not tight and the straps properly adjusted. It should go without saying to fasten the strap. No kidding, some people don't think about it. Helmets, like hats, come in sizes such as small, medium, and large. So, it is important to try the helmet on for size before buying. If one has questions, most bike store staff can help on getting the fit and adjusting the straps.

Recently the helmet industry has undergone a change in how to protect our brains. Riders when they fall tend to come off the bike sideways. This sideways fall creates helmet rotation adding to the likelihood of concussions. Two solutions have emerged. One that has been out since 2010 is MIPS (multi-directional impact protection system). The more recent is WaveCel.

A MIPS helmet achieves its rotational protection by using an internal plastic layer and stretchy fabric adjoining the crush-up material. During a fall the internal plastic slips about the external layer allowing the helmet, not the head to rotate and release safely the rotational energy. WaveCel achieves the same protection, but by an internal layer of malleable plastic forming a three-dimensional mesh. The mesh can crumple, flex and glide sideways on impact achieving both directional and rotational energy protection.

Is one better than the other? The answer is uncertain. What is most certainly true is these two technologies add significantly better protection than the "traditional" helmet design. That's good news; however, WaveCel and MIPS cost more than the older helmets. For my money, I'll pay the difference for the added protection. But any quality helmet, regardless of MIPS / WaveCel, is better than no helmet.

Comfort and intended usage are essential in selection. Fit is the most important. Another is how the helmet vents. Weight may be an issue as well. For mountain bikers there is a removable front visor. Also these helmets, heavier, provide additional impact absorption and back of head protection. Road helmets, by comparison are lighter and better ventilated. For commuters, there may additional features such as place for lights to clip on. Bottom line if the comfort and fit are wrong, one is less likely to wear the helmet.

And now the answer: One must always replace a helmet if it has been impacted such as during a fall. Both the crushing material (direct impact) and the rotational protective system will have been compromised. Additionally, the crushing material over time will break down and lose the protective energy absorption property. Smart money is to replace a helmet once every four to five years. How much to spend? How much is your head worth?

If you have a question for Dr. Spoke, send an email to "[DrSpoke@nmts.org](mailto:DrSpoke@nmts.org)" and watch for a response in a future newsletter.

An archive of this and prior "Ask Dr. Spoke" articles is available on the NMTS web site at <https://www.nmts.org/spoke.php>.

