

# PERFORMANCE CYCLING CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING CYCLISTS

[www.performancecondition.com/cycling](http://www.performancecondition.com/cycling)

## HEAD INJURIES FROM MEDICINE OF CYCLING CONFERENCE

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ead injuries, compared to upper extremity and skin injuries, occur less frequently in cycling accidents; however they can have more serious consequences for the rider. Helmet improvements in both protection and comfort has vastly improved along with the attitudes of wearing helmets to the point where riders will chastise each other to comply. Sanctioned racing and bicycle events have mandatory rules requiring helmets to participate making

the practice routine. Still, injuries do occur and should be ruled out because too often riders are allowed to continue to ride. The professional cyclists we see in the races set the tone for the amateur and recreational cyclists.

**From Dr Mark Greve, MD, team doctor for pro cycling team Novo Nordisk:** *Generally, so long as a rider is willing and able to get back on his bike, he is permitted to ride. Even riders rendered unconscious, so long as they wake up, will be allowed back on the bike by many physicians. While this is still permitted, it is likely to change very soon —because it's crazy. Lacking leadership from organizing bodies, groups tasked with providing medical coverage, such as Medalist Sports, have permitted their physicians to use standardized treatment algorithms for assessing neurologic injuries in cyclists. Of all the injuries one could have, traumatic brain injury (TBI) is one of the most serious, more common, and hardest to diagnose. Loss of consciousness is far from the best test for neurologic injury. Of the most severely injured riders, those with major TBI, it's unlikely they will be awake and alert for long. For these riders, the clock has started. Every step in their care carries with it the critical outcomes of life and death, disability and recovery.*



Paul Engler

High energy crashes such as fast down hills, road races, or with motor vehicles increase the chances of injury. The nature of how the rider crashes such as going over the handle bars is a clear warning sign. Such a collision does not dissipate the energy before the head makes contact with the ground which increases the chance the rider will hit head first before the rest of the body, taking the full force of the energy into the skull.

### MIPS helmet impact deflection.

In a side collision, the legs, shoulders, and back will absorb the energy first, before the head makes contact to the ground and lessens the energy transference to the skull and brain. Going over the handle bars or has some say, “doing an endo,” prevents the rider getting arms out taking the brunt of the blow. Spinal injuries of the neck should be a high concern.

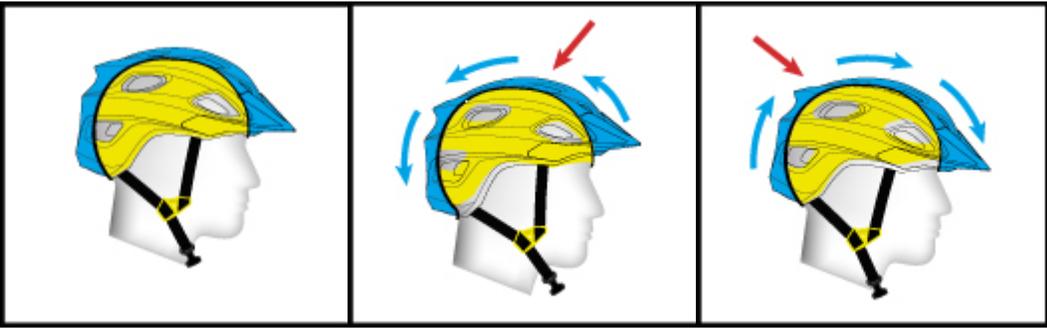
A broken helmet, or a laceration and bleeding to the head, and loss of consciousness is a clear sign energy transference occurred to the skull which requires further medical assessment. Any complaint of neck tenderness should be taken seriously. These are usually clear to the layman bystanders and fellow riders to either call EMS or get the rider taken to ER as soon as possible.



Gina Poetner

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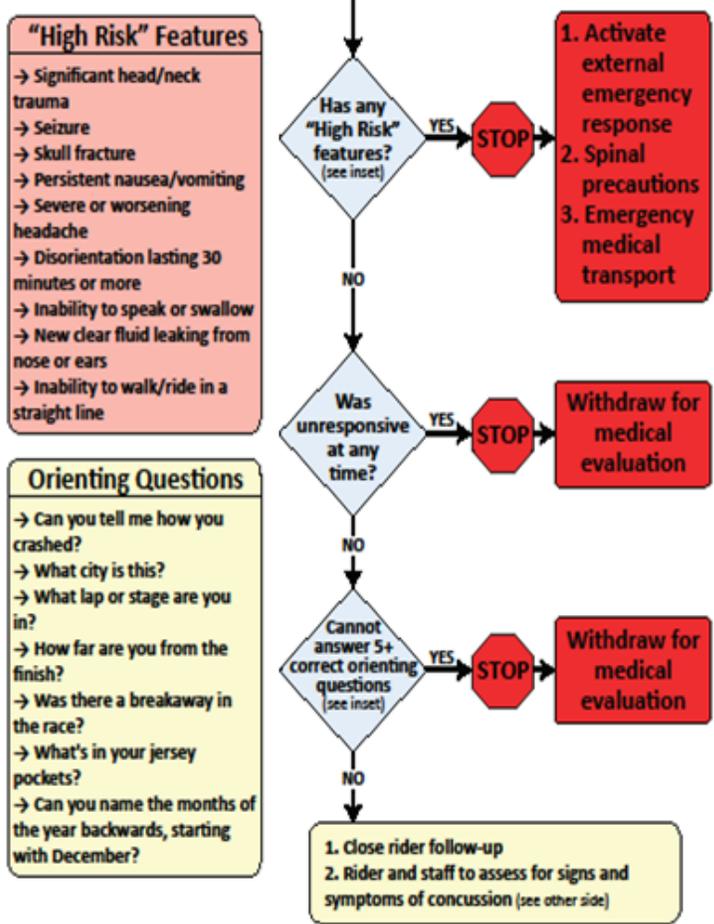
More studies are showing lower impacts can have an effect on the brain and should be taken into consideration. Attached is a tool the Medicine of Cycling™ medical committee developed. This flow chart helps event organizers know how and when to intervene for medical evaluation or when to let the rider continue the event. The first people on scene of a bicycle accident are usually fellow riders or event volunteers. This flow chart tool works much better than asking the rider how many fingers you're holding up in front of their face!



## Traumatic Brain Injury in Cycling Evaluation Card *for racing and training*



Following a crash, assess for the following:

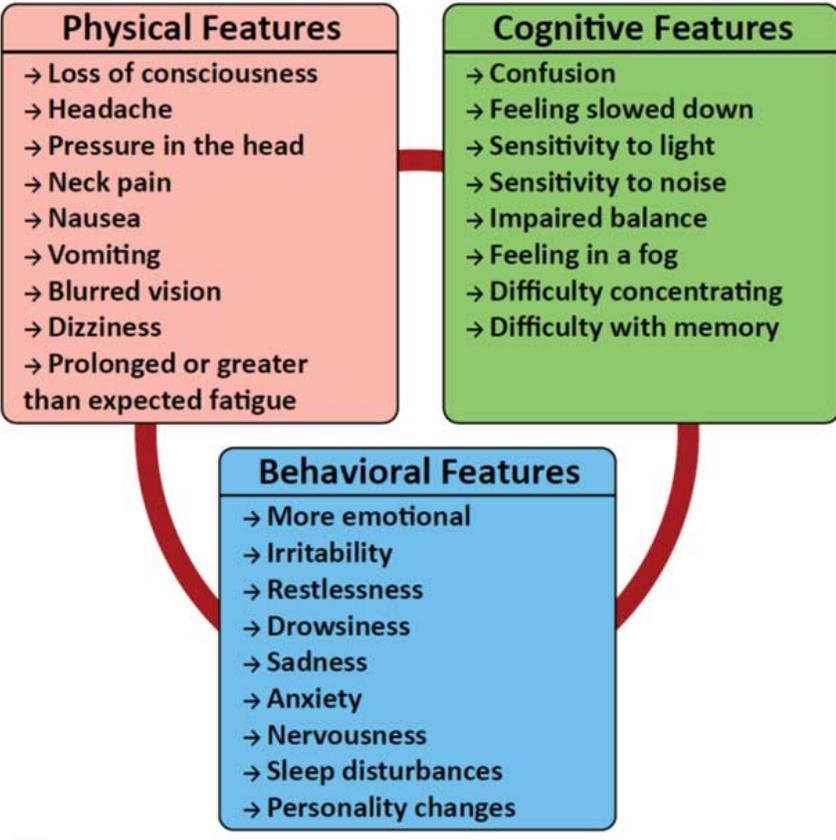


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 In case of emergency, call the local emergency number. The information on this card is not a replacement for medical evaluation. Please refer to the full Concussion in Cycling Consensus Statement at [www.medicineofcycling.com](http://www.medicineofcycling.com) or other current concussion resources for more information.

## Signs and Symptoms of Concussion in Cyclists



Regardless of the cyclist's ability to continue to race or train, any athlete suspected of concussion should be observed by teammates, managers, friends and/or family for signs and symptoms of a concussion. Athletes with symptoms of concussion or other concerning changes in their health should seek medical attention and avoid activities which exacerbate these symptoms.  
 Early and ongoing signs and symptoms may include, but are not limited to:



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These charts are a good item to keep in first aid kits or as a handout to volunteers for guidance. Do not assume your volunteers will use good judgment. Volunteers are not screened and may have no medical background. Locally, we had a case this year where an 18-year-old male racer crashed on the pavement, with bleeding to the head, his helmet was cracked, and sustaining a shoulder injury. The volunteer of the wheel car ask if he was alright and left him to be picked up by his father from the finish line. Injury always

supersedes the duties to provide spare wheels to riders.

Race directors and event planners who do not have a medical plan in place are only giving lip service to providing a safe race for participants. Risks are part of cycling but should be minimized at every level by providing EMS personnel, a plan to call EMS and when to call EMS or transport person to local hospital. The plan will depend on the size of each event.

If an injury occurs during a race or event, it would be good to have it documented to help cover expenses if follow-up is necessary. MRI and CT scans are usually ordered to look for signs of traumatic head injury. At an event sanctioned by USA Cycling, an injured rider fills out a First Report of Occurrence form, or someone can get it started for them if they are unable or need to be transported quickly. The Chief Referee and/or Race Director will have these forms on hand which should be signed and dated by the Chief Ref or Official. This is the beginning of the documentation process for a sanctioned event.

In any assessment, it would be ideal to know the medical history, look for medical bracelets or interview bystanders or other riders what preceded the accident. Medical condition could be the underlying reason for the crash. Seizure disorder or diabetes leading to hypoglycemia could be the initial cause of the crash as the rider loses cognitive ability.

The technology in helmet design and head injury prevention continues to move forward. A new helmet system emerged in the pro ranks called the MIPS® Brain Protection system which is now available in many brands of helmets. MIPS® is an acronym for Multi-directional Impact Protection System. In a helmet with MIPS®, the shell and the liner are separated by a low friction layer. According to the company, MIPS AB, “When a helmet with MIPS Brain Protection System is subjected to an angled impact, the low friction layer allows the helmet to slide relative to the head.”

The link below provides videos and demos. The MIPS® system is currently offered in ski and bicycling helmets. Wearing correct equipment, a good medical plan, and using effective assessment tools can reduce the severity of head trauma.   
<http://www.mipshelmet.com/#what-is-mips>

#### **About the Authors:**

*Paul Engler, BSN, RN has been working in medicine for 25 years. A cyclist for more than 30 years, he has enjoyed riding for recreation, racing, and gravel grinding. Paul is a member of the Lawrence Bike Club, Kaw Valley Bike Club, Medicine Of Cycling, and USA Cycling. Contact Paul at: [paul.engler@doc.ks.gov](mailto:paul.engler@doc.ks.gov)*

***Gina Poertner, CHES**, is the founder of Life Balance Sports specializing in bike fitting, soft tissue mobility, and adapted sports. Gina has trained athletes from beginner to elite for 25 years and is a USA Cycling official. Find out more and to contact her go to: <http://www.LifeBalanceSports.com>.*



*The MIPS liner in a Lazer brand bicycle helmet.  
Photo credit: Lazer Sport*