

Brain injuries are a common and worrisome risk for kids — and active people of all ages

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When she bonked her head on a picture frame in January, Avery Campbell, 12, sat down on the edge of the fireplace and gathered herself.

The blow hurt. She felt out of sorts. Campbell assumed after some head-rubbing and aspirin, she would be fine.

But four months of skull-cradling and prescription medications later, she was just inching back to health.

Campbell had suffered a nasty concussion, complete with screaming headaches that she routinely rated at 10, or above, when doctors asked her to describe the pain on a scale of 1 to 10. The injury kept her out of the pool, gym class and even school for a spell.

And while she was in school, she wasn't always sitting at her desk; instead, school officials turned a storage closet into a space for Campbell. When the headache pain started to increase, she would enter the dark, quiet broom closet and just sit.

"Now, it feels like a dream, a really bad dream," said Campbell, who is back on her swim team and gearing up for middle school in Littleton.

"We kept saying we can't wait to get our old Avery back," said her mother, Leslie Campbell. "She has a fun personality, always laughing, very social. And during this whole time she was not herself at all. She was just out of it."

Just a decade ago, Campbell might have received little more than a (gentle) pat on the head and a Costco-size jar of ibuprofen.

Fortunately for Campbell, things have changed in the mysterious world of concussions — mysterious because while doctors can diagnose the condition, relatively little is known about how they unfold in the brain, from jolt through symptoms and recovery.

"We used to say it's just a ding," said [Karen McAvoy](#), director of the [Rocky Mountain Youth Sports Medicine Institute's Center for Concussion](#). "We don't do that anymore. We emphasize that it's a brain injury."

Concussions are especially worrisome for kids, whose brains are growing and who take longer to recover. With Colorado schools about to begin again, the state is entering the high season for concussions, which coincides with fall sports like football.

But anyone who participates in fitness activities where a head injury is more likely — such as cycling, skiing, horseback riding and climbing — should be aware of the signs and take precautions. In addition,

understanding that a concussion can result from a seemingly benign fall while running, ice skating or simply tripping and hitting the head on a hard surface can go a long way toward recognizing the symptoms and aid in faster recovery.

Meanwhile, the key to recovery, doctors say, is forcing the brain to rest. That means no activities that could jostle it, from playing soccer to riding on a rollercoaster. But "rest" applies to more than the physical. Calculus, " [Top Chef](#)" on TV, " [Tomb Raider](#)" on the game console, and even turning the pages of " [Lord of the Rings](#)" can prolong concussion recovery time, if not set it back.

"There are kids with a hit on Friday night, and they are low-key all weekend," said McAvoy. "Then they go to trigonometry on Monday and get symptoms. It is routine to see kids at 10 a.m. on Mondays. In many cases, concussions don't manifest until the brain is taxed."

Why the delay? When concussions happen, the brain bounces around in the skull. The back-and-forth loosens channels that distribute potassium and calcium inside the brain. Under normal conditions, those channels function in a way that lets the brain do its thing, but concussions mess with the balance.

When the brain isn't getting pushed, the system doesn't become especially leaky. But toiling to understand plate tectonics? The brain gets fired up, said McAvoy, and that's when the imbalance appears in the form of symptoms: headaches, confusion, exhaustion.

"It's the brain running on empty," said McAvoy. "If you rest, the brain cells heal themselves."

That rest begins immediately after the head gets battered. The old admonition to keep your kids awake after a suspected concussion is history — let them sleep, said Dr. Aaron Provance, a physician at [Children's Hospital Colorado Sports Medicine Clinic](#) who specializes in concussions.

"If you want to check on the child, you can check the pulse, make sure they are breathing," he said. "But if something life-threatening is going on with them, they will wake up and have the worst headache of their lives."

Provance said one new twist hinges on diet. The goal: Introduce antioxidants, which destroy damaging free radicals.

"Most experts would recommend omega-3 fatty acids, with fish-oil supplements," he said. "Make sure they are eating healthy and drinking a lot of water."

Provance is part of team that won a grant to study whether neck muscular strength and concussions are related; that is, if stronger neck muscles prevent concussions by helping to mitigate the brain's jostling after a blow. It's one of many areas around concussions that are under study.

"It would be nice if we had a test to tell us this kid does or does not have a concussion, and the severity of the concussion," said Provance. "We have to wait until symptoms are resolved before we can tell parents how severe it was. There is a lot of work to be done, and there is a deep gap in the research."

Campbell's recovery was arduous, but now she is returning to her old form, although she doesn't swim backstroke, out of fear she will strike her head on the pool wall. She never wants a concussion again, and while the research is not exhaustive, it appears that concussions come easier, and are more damaging,

after the first one.

"I say to myself now, 'Wow, I actually laughed,'" said Campbell. "When I started to swim again, I said, 'Yay, I'm finally able to do what I want to do. I'm not just sitting on a couch staring into space.'"

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More resources:

- The nonprofit **Brain Injury Alliance of Colorado** is dedicated to assisting people with brain injuries. 303-355-9969, biacolorado.org
- **Sports Concussion Center of Colorado** features physicians who are board-certified in both sports and family medicine. 720-898-1110, sportsccc.com
- **The Rocky Mountain Youth Sports Medicine Institute's Center for Concussion**, where physicians and therapists work with concussion patients. 720-979-0840, rockymountainhospitalforchildren.com/sports-medicine/concussion-management
- **Children's Hospital Colorado** has a number of physicians who specialize in concussions. 720-777-6600, or 720-777-3899 for the sports medicine team, childrenscolorado.org