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UPMC uses 3-way approach to treat head injury

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By Chuck Finder, Pittsburgh Post-Gazette



Bob Donaldson/Post-Gazette

Gaige Pavlocak listens as Cara Carniolo Reddy, a physician who specializes in medications, reviews his experiences with the medications she's prescribed for him.

Gaige Pavlocak is 15 and two full months into one nettlesome concussion. He continues to tolerate headaches and vision problems from a helmet-to-helmet collision Aug. 18, the third day of football camp at Southmoreland High School. He has been in and out of school since then, full days and half days and no days. While again home and out of school, he slept through much of the past week.

That's precisely what his doctor, a rehabilitation medicine specialist, ordered.

A sleep aid was among the five different daily medications and supplements she prescribed, after multiple visits, for the high school sophomore.

Medication is part of a three-pronged approach by UPMC Sports Medicine to treat lingering concussions in young athletes. The benefits haven't been widely accepted across the concussion-treatment community, but the doctors involved believe the early evidence is strong that this course of treatment helps. It includes:

- Clinical tools, such as a doctor's examination and regular tests for brain function levels via their Immediate Postconcussion Assessment and Cognitive Testing (ImPACT).
- Vestibular (or equilibrium-related) therapy, which is commonly used for people with inner ear or balance disorders but here is used to address the vision and balance problems that afflict so many young athletes with concussions.
- Medicine therapy.

"Have my own medicine cabinet," Gaige said, offering a wan smile.

There's a supplement of melatonin, a naturally occurring compound that regulates sleep cycles. There's magnesium for headaches, and a multivitamin to stimulate energy amid the brain's fogginess.

There's the drug amantadine, a neurostimulant used to treat Parkinson's disease but in this case aimed to help alleviate his cognitive fatigue headaches. When Gaige was going to school, the headaches got so bad he would bypass physical education class -- also doctor's orders -- to lie down in the nurse's office between math and English classes.

There's the anti-depressant amitriptyline, prescribed for the whiplash headaches in a brain where the chemical balance remains off kilter from the concussive collision.

His parents got a bit of a fright from that last drug's laundry list of potential adverse reactions.

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"There are some pretty scary side effects with this [medication]: depression suicidal tendencies," said his father, Jeff Pavlocak, 41. "Before we gave it to him, we sat him down and told him, 'We especially want you to know the side effects. So if you experience any of that stuff ...' "

Their rehab medicine specialist at the UPMC Sports Medicine clinic on the South Side, where they make almost weekly trips from their home in Mount Pleasant, explained that such a low dosage doesn't normally trigger emotional reactions.

Gaige's headaches in fact diminished in the week since he started the full medication battery, his father said.

For now, he lives by a rehab regimen: a half-dozen-plus pills daily; vestibular exercises to combat vision and balance issues; and sleep, sleep, sleep.

"Sleeping is first. If you're not sleeping, forget it," said Cara Camiolo Reddy, the co-director of the UPMC Rehabilitation Institute brain program and the medical adviser to the Sports Medicine concussion program. Sleep is vital in the recovery process because the injured brain needs rest to begin to heal itself. The concussion program and Dr. Camiolo prescribe medications, however, only to post-concussion syndrome sufferers who are three weeks or longer into their injury.

Eighty percent of these injured patients recover within those first three weeks. Gaige is among the fewer than 1-in-5 cases with what is called post-concussion syndrome -- "a miserable minority of patients who don't get better," said Michael "Micky" Collins, the concussion program's assistant director.

That's the timetable that triggers the multiple-treatment approach by UPMC Sports Medicine's concussion staff.

"If we can provide the right environment for the brain to heal, the better off it will be," Dr. Camiolo said.

"There's no cure for a concussion. There's no magic, FDA-approved drug. There's nothing I can sprinkle over their head and make this go away. But medications are just one more thing to help."

A few places, one being the University of Buffalo Concussion Clinic, uses two of the three treatment approaches regularly. But all three? Medical director John Leddy said that over the past four years the medication ingredient has been used sparingly, on roughly 30 or so patients yearly.

Meantime, UPMC's clinic sees that many patients in one day during football season. A number of the lingering cases are directed into the three-pronged approach, which remains in such an infant stage that they aren't exactly sure how many patients just yet. Dr. Camiolo places that number in "the hundreds."

They're preparing to publish research that she said shows this method has been "extraordinarily successful when we can intervene. [There is] very, very strong evidence that we can get those symptoms under control. Whether or not it speeds their recovery, that's where the research needs to go. There's still a lot of work to be done, a lot of research to be done."

Dubious doctor

Robert Cantu is doubtful, at least until more research exists.

For one thing, vestibular therapy isn't a sure thing to Dr. Cantu, an international expert who, among other positions, is co-director at the Boston-based Center for the Study of Traumatic Encephalopathy.

"Whether [vestibular therapy] makes a darn bit of difference instead of others, there's an honest debate about that," Dr. Cantu said. "I don't have any problem with somebody undertaking such a [course], understanding that it may not make a difference. The state of the science is there just haven't been double-blinded studies that this therapy works. I don't have any doubt that the Pittsburgh group will have an article out about it soon. "

As for using both vestibular therapy and medicine in combination, Dr. Cantu said: "Most people don't like to attack multiple areas."

UPMC's program leaders do, and they attack in those three waves regularly. In fact, vestibular therapist Anne Mucha, assistant director of neurologic/vestibular outpatient services for the Center for Rehabilitation Services, moved from Eye and Ear Institute to the South Side clinic last July. Dr. Camiolo, like Mrs. Mucha, has been working with concussion patients since 2006 but this summer began keeping more regular hours at UPMC Sports Medicine. A young athlete such as Gaige can take care of all three facets in a day's visit.

"For years and years, people who diagnosed the problem said, 'There's nothing we can do for you,' " said Mark Lovell, the concussion program director and founder of ImPACT. "Meantime, these kids were flunking out of school, bombing the SATs or failing in life. We had to look for other answers.

"Now we're probably the only place that I can think of ... [with] the complete therapy model."

Dr. Collins added, "What are we supposed to do, put them in a dark room and shut the door for six months?"

"Ten years ago, it was smelling salts and 'How many fingers am I holding up?' It's taken us years and years to reach this point, where we think we know how to treat it. As we peel the onion ... , we're finding more to it than we ever knew. We have set the stage to do something special from a treatment standpoint."

Eyes have it

Twice a day, Gaige has been doing what they call pencil pushups. He holds a pencil or pen at arm's length and gradually brings it closer to his nose, until reaching the point where the words on it become fuzzy.

In another exercise, he also strains to focus on a ball as he tosses it from one hand to the other, all while nodding his head up and down. He concentrates on the word "OK" taped to a wall. Sometimes, he does each while standing on a pillow to work concurrently on both his equilibrium and visual acuity problems.

In June, the program published a research paper in the Journal of Neurophysical Therapy about successful vestibular rehabilitation for dizziness and balance disorders in concussions. The eyes are the tip-off. As in Gaige's case, ocular motion, gaze stability and other vision difficulties are what Dr. Collins labeled the "biggest predictor" of recovery taking longer than usual.

It's a similarly slow process for Corey Peters, 14. He's a Seneca Valley High School freshman who on Sept. 13 sustained what he thought was his third concussion in two years. Rather, Dr. Collins diagnosed that the first one -- also from football -- never healed fully.

Corey, wearing his Seneca Valley football No. 28 jersey, described the pain from a helmet collision that ended his 2010 season: "My whole head felt like it was getting squeezed like a tomato."

Medication and eye therapy haven't helped enough yet to permit a return to school; he's meeting teachers at home or a library after school hours to try to keep up his work. Because of his sensitivity to light and noise, a week ago he had to celebrate homecoming at home -- despite the fact he earlier accompanied his girlfriend to buy a dress for the event.

By contrast, one vestibular success story is Zach Kagle, 12, an Avella High School seventh-grader who landed on his head making a tackle Aug. 28. He is scheduled to return to school for half-days starting today, despite a bit of an eye issue still.

"He's come a long way," said his dad, Mike, who, per doctor's wishes, allowed him Thursday to return to skating but not playing hockey -- Zach is a goaltender -- and light to moderate exercise.

"We didn't want to medicate him," his father added, but vestibular exercises such as gazing at an "OK" sticker while brushing his teeth and at a beaded string helped him improve.

Mrs. Mucha, the vestibular physical therapist, worked with balance and traumatic brain injury patients at Eye and Ear when the concussion-program leaders began referring patients to her in Oakland in 2006. Now at least twice a week she relies upon Post-It notes, a joker playing card, a beaded string, ball and "OK" stickers for her South Side therapy sessions. Other tools go high-tech: infrared goggles for a video program to study pupils and the inner eye, plus a computer-based Gaze Stabilization Test that resembles an arcade game.

As patients work with her, the drills grow more difficult and the exertion increases as well. Raising the heart rate and blood flow is the ultimate test for a concussion -- too much of that causes the symptoms to return if the concussion isn't healed. That's also the reason why, when patients pass her muster, she sends them into exertion therapy -- a widely accepted and utilized practice nationally.

"They definitely do better with therapy," Mrs. Mucha said of vestibular patients. "The brain is an amazing thing. You're re-training the brain.

"We're learning. We're not perfect at it yet.

"I guarantee you in a year we'll be seeing a few different things. But we have a pretty good start."

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