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## Greece first-grader beats long odds after cardiac arrest

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GREECE — Watching Cameron Knowles chase after the family cat and noisily play video games with little brother Zachary, it's hard to imagine that just a month ago the whirlwind 7-year-old lay dead on his bedroom floor for at least 12 minutes.

Around 7 a.m. on March 26, Mark Knowles came home from an overnight shift at his part-time emergency medical technician job with the North Greece Fire Department. Coming in the door, he inadvertently set off the burglar alarm.

He stopped at the bathroom to chat with his wife as she dressed for her job as a medical assistant at a Brighton cardiology office.

They both wondered why Cameron, a first-grader at Greece's Holmes Road Elementary School, hadn't bounded out of his room when the alarm shrieked.

"I thought I'd better go check on him, and it was time for him to get up for school anyway," said Mark Knowles, 33. "When I got there, he wasn't moving. At first I thought he was playing possum, 'cause he's that kind of kid, but I checked for a pulse and didn't find one."

He cried out to his wife, Rebecca, who ran in and probed Cameron's neck and wrist for signs of life.

"I said, "He's gone, Mark, he's gone," said Rebecca.

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Cameron Knowles shows friend Johnny Caputo his scar from having surgery for an implanted defibrillator. Cameron has long QT syndrome, a heart disorder that caused him to suffer cardiac arrest March 26. (CARLOS ORTIZ staff photographer)

#### Long QT and ADHD

The American Heart Association on April 21 recommended that all children who are starting stimulant medications to treat attention deficit hyperactivity disorder have a baseline electrocardiogram to screen for heart abnormalities before starting drug therapy. The Knowles family will never know whether Cameron's medications for ADHD contributed in any way to his cardiac arrest,

She pulled her son's lifeless, pajama-clad body from his bed and started CPR. Mark dialed the Greece Ridge Fire Department, where he works full time as a dispatcher and emergency medical technician.

"I said 10 words: 'My son is unconscious, get a squad to my house,'" he said.

### The worst kind of call

Firefighter Mark Quill and EMT Kevin Clarke pulled their rig up to 1296 Weiland Road just minutes later. "Every call you go on is important, but when it's someone you work with and a kid you see all the time at the firehouse visiting his dad, it's different," said Quill, a four-year member of the Fire Department.

He's been on dozens of cardiac arrest calls. There are few happy endings.

"In this business, usually the worst calls are pediatric cardiac arrest," said Clarke.

Once inside the Knowles' house, Quill hunkered down to deliver Cameron oxygen. Clarke hooked up an automated external defibrillator, or AED. Battalion Chief Andrew Paradiso assisted.

It was the first time anyone from Greece Ridge ever used an AED on a child.

"We gave him one shock, and kept up CPR, then a crew from Monroe Ambulance came," said Quill. "They shocked him two more times and started pushing meds."

Cameron's heart started to beat again. But, his father said, he'd been down at least 12 minutes, more than twice the five it can take to cause severe, irreversible brain damage.

As medical professionals all their lives, both Mark and Rebecca — both certified EMTs — knew Cameron's chances for full recovery were slim.

"Everyone kept telling me at the hospital that I was a hero," said Rebecca, 32. "But I didn't know what kind of hero I was. We didn't know if we'd saved his brain. I didn't know what kind of life he would have, what decisions we would have to make."

### Go Sox

With Cameron's heart pumping again, EMTs whisked him to Unity Hospital at Park Ridge, where doctors slipped a breathing tube down his throat while a pediatric intensive care unit team from Golisano Children's Hospital at Strong rushed from Rochester to Greece to retrieve him.

Dr. Andrea Hinkle, a pediatric critical care fellow at Golisano, was part of that team.

At first look, Cameron's prognosis was grim. According to the American Heart Association, less than 7 percent of all children who suffer cardiac arrest outside a hospital survive long enough to ever be discharged from a hospital. When there is significant time without a heartbeat, fewer still ever regain normal brain function.

"We were worried," said Hinkle. Although Cameron's heart was beating and he was breathing with assistance by the time he got to Park Ridge, she said, he was displaying some of the classic, jerky movements associated with brain trauma.

"It is very rare for a child with cardiac arrest to survive intact."

Blood tests given later at Golisano, however, showed Cameron had enough circulation from the CPR and defibrillation to keep his kidneys and liver working. Like the brain, those organs also fail if deprived of oxygen too long during cardiac arrest.

"Although the tests weren't absolutely predictive, we didn't see anything with his kidneys and liver," said Hinkle. "That's where we were beginning to become hopeful."

To help save Cameron's brain, Golisano doctors sedated him heavily and slowed his metabolism by

but at the time of his arrest, he was taking three prescribed drugs known to increase heart rate and blood pressure in children. For more information, go to [www.americanheart.org](http://www.americanheart.org) or [www.longqt.org](http://www.longqt.org).



First-graders Cameron Knowles and Katana Noble have lunch at Holmes Road Elementary School in Greece. (CARLOS ORTIZ staff photographer)

### How you can help

To donate in Cameron's name to the American Heart Association, go to [www.helpcameronfightheartdisease.org](http://www.helpcameronfightheartdisease.org). To purchase a \$1 Cameron's Crew Cares bracelet, contact Mark Knowles at [mknowles1@rochester.rr.com](mailto:mknowles1@rochester.rr.com).

### Long QT syndrome

According to the American Heart Association, long QT syndrome is an infrequent, hereditary disorder of the heart's electrical rhythm that can occur in otherwise healthy people. It usually affects children or young adults. Often, those with the syndrome can show no symptoms until sudden cardiac death.

Those who do have symptoms often exhibit fainting and abnormal rate and/or rhythm of the heartbeat, known as arrhythmia. People with this syndrome may show prolongation of the QT interval the time for electrical activation and inactivation of the heart's ventricles during physical exercise, intense emotion (such as fright, anger or pain) or when startled by a noise. Some arrhythmias are potentially fatal, causing sudden death. The disorder is often treated with medication, surgery or an implanted defibrillator.

Long QT syndrome can be detected during an electrocardiogram. For more information, go to [www.americanheart.org](http://www.americanheart.org) or [www.longqt.org](http://www.longqt.org).

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lowering his body temperature to 34 degrees Celsius (about 93 degrees Fahrenheit) for a day. Over an additional 14 hours, they slowly brought his body temperature back to a normal 37 degrees Celsius (about 99 degrees Fahrenheit.)

Warmed up, on March 29 Cameron started fighting against his breathing tube.

Mark returned from errands that afternoon to find his wife sobbing in Cameron's room.

"I was crying because I was happy," said Rebecca.

Watching Cameron awaken, nurse Staci Goldstein had asked two questions that left his parents no doubt their boy's brain was OK.

"She said, 'Cameron, do you like the New York Yankees?' and he shook his head no," said Rebecca. "Then, she asked, 'Do you like the Boston Red Sox?' and he nodded yes."

Hinkle said Cameron's quick-acting parents and the first responders apparently kept the boy's blood flowing well enough to prevent serious damage.

"He had a really excellent resuscitation by the first responders, and we have to give everybody a lot of credit," Hinkle said, adding that she and Cameron bonded during his stay over their mutual love of the Red Sox. "But we deliver the same level of care even to Yankees fans."

### **A thoughtful, caring boy**

Cameron, who returned full time to Holmes Road Elementary School this week, has a heart condition called long QT syndrome. The illness is a hereditary disorder of the heart's electrical rhythm that affects the time it takes for beating heart muscle to contract and then recover to beat again.

The disorder, which usually affects children and young adults, can occur in otherwise healthy people and often shows no symptoms until sudden cardiac death.

That's what happened to Cameron on the day now known as his "second birthday."

The Knowles family wants to get the word out about long QT syndrome and the importance of being screened. After Cameron's cardiac arrest, they all got tested. As it turns out, Mark has the ailment too but is controlling it now with medications.

"For a lot of kids, long QT is discovered far too late," said Rebecca. "You can't diagnose it post-mortem."

The family is selling bracelets to benefit the Cardiac Arrhythmias Research and Education Foundation. Cameron has his own American Heart Association Web page to raise funds for heart research. His classmates are jumping rope today to raise money in his honor.

Teacher LuAnn Principe said her class was "devastated" to learn Cameron was ill.

"When you mention his name, the first thing you do is smile because that's the first thing you see on his face," she said. "He's an intelligent, thoughtful, caring young boy."

She said today's planned Jump-A-Thon is a way for the kids to turn feelings into action.

"Writing him cards and letters helped, but this is something else they can put their energies in," she said. "They want to help with cures and research so some other 7-year-old won't have to go through what Cameron went through."

Cameron doesn't remember much of his ordeal, not even how he called the first doctor he saw after waking "an idiot" for sticking a needle in his arm or how he later asked for a chocolate doughnut.

Because of long QT, he'll never be able to participate in competitive or contact sports. He'll always need an implanted defibrillator. His family keeps a red-boxed AED tucked in a corner of their living room.

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He came home on April 11, brother Zachary's 5th birthday.

Despite getting a television set and a skateboard, Zachary says his best present that day "was having my brother Cameron come home."

Cameron giggled, throwing himself on the couch cushions, pulling up his red Boston Red Sox No. 24 Manny Ramirez shirt to show off the zipper scar bisecting his chest.

Surgeons told him to call it his "chick magnet."

He does.

Then, giving a gap-toothed grin, he turns serious.

"Mommy," he said. "You do so many nice things for me. Thank you for giving me CPR."

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