

By Robert Davis, USA TODAY

By Poseidon Technologies

Jean-Francois LeRoy was rescued from drowning thanks to the Poseidon system.

Safer Pools Through Science

Jean-Francois LeRoy was trying to set a personal record when he pushed his body too far. The 19-year-old French apprentice optician was trying to swim 100 yards underwater without taking a breath when his body gave out about 25 yards too soon. "I swam one length of the pool and I was on my way back when I felt stinging, like pins and needles, at the end of my fingers," he says. "That is the last thing I remember." LeRoy passed out, inhaled water and sank to the bottom of his hometown public pool in Machecoul, France. Lifeguards, preparing to close the pool for the night, did not see him sink on the evening of Nov. 20. When they noticed him on the bottom, the lifeguards stared for a few seconds, wondering whether he was playing. As they faced indecision, a computer system that acts as a high-tech backup for lifeguards made the call. The system sounded an alarm. The lifeguards dived in, pulled LeRoy out of the water and revived him by performing CPR.

"The next thing I remembered, I was out of the water next to the pool, and the lifeguards were holding onto me," LeRoy says through a translator.

The system, called Poseidon, uses video cameras hooked to a computer that watches the bottom of the pool for swimmers in trouble. When it detects trouble, it sends a message to a waterproof pager worn by the lifeguard.

LeRoy recovered fully from his near-death experience. He says, with a chuckle, that he has "no scars."

Pool safety advocates wonder if the computer system can prevent the thousands of scars that are caused each year by drownings. On average, six people drown in pools each day in the USA. It is the leading cause of accidental death for children under the age of 5.

But that is just part of the story. For every drowning victim, another four people are pulled from the water, resuscitated and hospitalized. Many of these people go on to live with severe brain damage, which is caused by a lack of oxygen.

"The brain damage is worse," says Nadina Riggsbee, whose two tots were found by a babysitter in the family pool more than 20 years ago. Her daughter died. Her son lived. "For the ones that remain living, it's like a living hell."

She says with time, the family heals after a death. But her 24-year-old son, Jerry (they call him "JJ,"), is like a big newborn. "His speech is gone. He screams and cries and you have to figure out what's wrong. It's a process of elimination — a guessing game," she says. "You keep him clean. Feed him. Shave him. Do preventive care. It's the whole nightmare."

After her children fell in the pool, Riggsbee founded the Drowning Prevention Foundation, a non-profit group that pushes for pool safety legislation and distributes drowning prevention materials.

The Foundation doesn't endorse products and Riggsbee has not yet seen the Poseidon system — which has been used in Europe but is just now being installed in pools in the USA — but she says "I'm very excited about the product."

"It only takes a couple of minutes and bing, you're gone and you end up with brain damage," she says.

Today, technology — from security gates at poolside that close automatically and lock to laser beams that, when crossed, alert pool owners that somebody has entered the water — helps keep swimming pools safe. But Riggsbee says no other system uses a computer to watch the bottom: "We have nothing as high-tech as this."

The technology that drives the Poseidon system has only been made possible recently, as the same digital video processing that allows us to watch DVDs has progressed.

About two years ago, computers became powerful enough to process video in real time. Cameras mounted in the pool's walls keep a constant watch underwater. All objects are analyzed by the computer. The computer focuses on the ones that raise suspicion of drowning: Those that are sinking or have sunk.

The system's designers created a cyber-watchdog that can tell the difference between a drowning swimmer and a playful diver. When swimmers try to hold still on the bottom of the pool, they have involuntary movement. The Poseidon system can spot a truly motionless body in seconds.

Lifeguards are taught to scan the parts of the pool they are responsible for every 20 seconds. The goal is to get a victim out in less than a minute.

Speed is key because the brain and other organs are damaged the longer they go without oxygen. Just a few minutes underwater can prove deadly.

While there's no guarantee that it will spot every victim, in St. Cloud, Minn., where the school system is installing Poseidon in all four of its pools, officials just want an extra layer of safety.

"There is no guarantee in life," says Mike Forer, environmental health and safety supervisor for the schools. "It's just a third eye — an assist to our lifeguards."

In addition to installing the Poseidon system — which costs about \$75,000 — the St. Cloud school system is also adding oxygen units and automated external defibrillators at each pool.

Forer says he'd like to think that the safety improvements would have happened anyway, but after a student drowning "traumatized everybody," the school board approved the projects easily.

Shuai Jiang, 13, was found dead in the Apollo High School swimming pool about 20 minutes after his swimming class ended on Nov. 16, 1999, a year before LeRoy's near-drowning in France.

St. Cloud officials were moved by the video images the Poseidon system captured of LeRoy lying motionless on the bottom of the French pool before being pulled to safety. They wished they could have had the kind of alert that led the lifeguards to yank LeRoy out within 20 seconds.

"We're moving fast," Forer says. "I've been in health and safety for 23 years, and this technology is just downright exciting.

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