

'Rapid autopsy' programs seek clues to cancer within hours of death

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After Keith Beck died of bile duct cancer last year, family members said more than 900 people showed up to pay respects to the popular athletic director at the University of Findlay in northwestern Ohio.

Many were former students who recalled acts of kindness during Beck's nearly 30-year career: \$20 given to a kid who was broke, textbooks bought for a student whose parents were going through bankruptcy, a spot cleared to sleep on Beck's living room floor.

But few knew about Beck's final gesture of generosity. The 59-year-old had agreed to a "rapid autopsy," a procedure conducted within hours of his death on March 28, 2017, so that scientists could learn as much as possible from the cancer that killed him.

"He was 100 percent for it," recalled his ex-wife, Nancy Beck, 63, who cared for Beck at the end of his life. "It wasn't the easiest thing to do, but it was important."

Beck donated his body to a rapid-autopsy research study at the Ohio State University, part of a small but growing effort by more than a dozen medical centers nationwide. The idea is to obtain tumor tissue immediately after death—before it has a chance to degrade. Scientists say such samples are the key to understanding the genetics of cancers that spread through the body, thwarting efforts to cure them.

"People are recognizing that cancer is more heterogeneous than we

realize," said Dr. Sameek Roychowdhury, a medical scientist at OSU's Comprehensive Cancer Center. "Different parts of your body may have different cancer cells, even though they originated from the same cancer."

In Beck's case, results from the rapid autopsy showed he had developed a mutation that caused the experimental drug he was taking, known as an FGFR inhibitor, to stop working. Roychowdhury and colleagues plan to report on Beck's case in an upcoming paper.

"This is helping us shape how we develop this new drug," Roychowdhury said. "How can we make a better drug? Or can we make a better drug combination?"

Rapid-autopsy technology has been available for decades. Researchers at the University of Washington in Seattle have been using the technique to study prostate cancer since 1991. Scientists at the University of Nebraska Medical Center launched a now-robust program in 2000.

But only in recent years have more hospitals been launching and expanding programs, said Dr. Jody Hooper, director of the Legacy Gift Rapid Autopsy Program at Johns Hopkins Medicine in Baltimore. At last count, there were 14 similar programs in the U.S.

Funding for them varies, Hooper said, but typically they're supported by a mix of cancer program resources, grants and researcher fees.

Scientists recognize the value of examining tissue from multiple sites soon after death and obtaining larger samples than they could while a patient was living. Cancer cells can be retrieved during such autopsies and kept alive, allowing researchers to experiment with ways to treat—or kill—them.

"It's the power of sampling over the entire body at the same time," said Hooper, who conducts about one rapid autopsy a month, often providing tissue for up to a half-dozen researchers interested in different questions.

Most programs focus on cancer, but efforts are underway to expand the practice, possibly to shed light on virus reservoirs in HIV patients, for instance.

Speed is essential to preserve RNA and DNA, the building blocks of cells, which can degrade quickly after death. It's best to obtain specimens of living cells within six hours of death and other tissue within 12 hours, Hooper said.

The need for speed is also what makes such autopsies challenging. Families must consent to the procedure, often while freshly grieving their loved one's death. And the logistics surrounding retrieving a body, conducting an autopsy and then returning the body for a funeral are often complicated. Traffic is unpredictable and "one time, there was a blizzard," Hooper said.

Roychowdhury said he and one of his clinical fellows are on call at all times.

"The patients have our cellphone numbers, as well as the next of kin," he said.

Broaching the subject with patients and families requires tact and compassion. Most patients are enrolled in clinical trials and learn about the autopsies from their doctors or pathologists like Hooper. Many are willing, even eager, to cooperate, she said.

"These are mostly patients with metastatic [cancer](#)," she said. "They've made their peace with the outcome long before."

For some, the rapid autopsy is simply the final phase of the clinical trial.

"They want to do something not only for themselves, but also to help others," Roychowdhury said.

That's how Linda Boyed, 52, of Lewis Center, Ohio, sees it. Like Beck, she has [bile duct cancer](#) and is enrolled in a trial to treat it. The drugs are working now, but Boyed said she has agreed to a rapid autopsy after death so scientists can learn from her when they're no longer effective.

"I have a strong Christian faith," she said. "I believe we're put on this Earth to help each other."

Because the rapid autopsies are paid through program funds and grants, there's no cost to the families. Bodies are returned within a day and in a condition that doesn't affect funeral plans.

"My emphasis is that it was all done with dignity and respect," said Nancy Beck. "We felt honored to be able to do this."

Performing the [autopsy](#) after treating a patient in life is an honor for doctors, too, Roychowdhury said.

"This was once a living, breathing person that came into my office every other week," he said. "The thing I want to think about each day is that they've given so much so that others can benefit."

"Everyone has something to teach us after death."

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