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When brain death isn't terminal

How did a man declared brain dead by medical professionals end up back in the land of the living? The emergence of Zack Dunlap's story last month made some people wonder if it's possible to be written off prematurely in the trauma ward.

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How did a man declared brain dead by medical professionals end up back in the land of the living? The emergence of Zack Dunlap's story last month made some people wonder if it's possible to be written off prematurely in the trauma ward.

Like a lot of young men in small towns, Zack lived for his wheels – a souped-up all-terrain vehicle. The 21-year-old factory worker spent his free time roaring around the countryside near his hometown, Frederick, Okla., a farming/ranching community of about 4,200. He was so adept at "wheelies" and stunts that his friends called him "Outlaw."

Last November, he popped a wheelie that some insist was fatal – even though Zack is now walking and talking again. When he landed, he had to veer suddenly to avoid hitting a fellow ATVer, causing his four-wheeler to flip in the air. Zack, who wasn't wearing a helmet, crashed onto the pavement. Before long he was medevaced to United Regional Healthcare System in Wichita Falls, Tex., about 80 kilometres away, where he was put on a ventilator.

Thirty-six hours after the accident, Zack was declared brain dead. The hospital notified the authorities, news reports of his death were published, and preparations were made to harvest his organs.

But when family and friends were called in to make their last goodbyes, Zack's cousin, Dan Coffin, decided to check Zack's vitals one last time. When he ran his pocket knife along Zack's foot and

applied pressure under a fingernail, the young man's body responded.

After 48 days in the hospital, Zack was able to return home to Frederick. He continues with rehab, which he finds challenging. "Just ain't got the patience," Zack told NBC.

All of which raises the question: Is brain-death testing fallible?

If done properly, absolutely not, says Dr. Neil Lazar, a professor of medicine at the University of Toronto. Lazar won't comment on Zack's case specifically but said in an email interview that if proper procedures are followed, brain death "is not a difficult diagnosis. Mistakes should never happen."

Lazar, a respirologist and site director of the medical surgical intensive care unit for the University Health Network, is the principal author of an article on ethics and brain death in the *Canadian Medical Association Journal* in 2001. Brain death, he says, takes place when a severe brain injury such as stroke or trauma causes both the upper brain (or cerebral cortex) and brain stem to "permanently and irreversibly (lose) all function." Without life support, this leads to cessation of breathing, which in turn causes the heart to stop.

Physicians perform a careful bedside examination to establish brain death. Mainly they assess whether the patient, disconnected from a ventilator, is making any effort to breathe, and they check for reflexes or movement controlled by the brain stem or cranial nerves.

"Irreversibility is one of the main considerations when making a diagnosis of brain death," notes Lazar. "I always say to my students, 'Brain death is never an emergency diagnosis.' When in doubt, we can always continue to support the patient and observe for any signs of life. This observation period can be as short as six hours or one or two days, depending on the circumstances ...

"Remember, time is always on the side of the patient. When in doubt, wait."

Dr. Leo Mercer, director of trauma services at United Regional, did not return the *Star's* calls, but he said in an interview with NBC that Zack's brain injuries "were absolutely catastrophic." He added that the hospital used "a confirmatory test, a brain-flow study," which found there was no blood flow to the injured man's brain.

"He was dead. He (met) the legal, medical requirements for declaring a patient brain dead."

In earlier news reports, Zack's maternal uncle, appliance-store owner James Blackford, was quoted as saying, "Doctor came back down and said, 'Well, I don't know what happened. But I guess it was faulty equipment on the first test.'"

But Blackford and other members of the deeply religious family believe that prayer brought Zack back. "I don't think there was no mistake," Blackford told the *Star*. "Just a miracle from God. I believe he was dead and gone."

Lazar points out that he and his peers perform brain blood-flow tests to support the diagnosis of brain death "only when we cannot for some technical reason complete the neurologic exam at the

bedside." The bedside clinical exam, he says, is the "gold standard," and brain blood-flow studies should never be used to replace the exam, only to confirm it.

Brain death is not the most common way doctors diagnose death in day-to-day practice. Most people, says Lazar, die "because their hearts stop or they stop breathing."

Before the 1960s, in cases of brain injury death was pronounced only when the heart or lungs shut down. But with the advent of life support that could keep the heart and lungs working, some brain-injured patients could deteriorate to the point of having clinical signs of brain death that would not have been evident with earlier treatment protocols.

Lazar says the advent of organ transplantation, too, meant there was a certain logic in establishing the brain-death diagnosis: Good transplant outcomes and successful heart transplants depend on the heart still beating.

In his article for the *Canadian Medical Association Journal*, Lazar notes that brain death as a criterion for death is a "social formulation ... it implies a notion of irreversibly lost personhood."

Not everyone agrees. Orthodox Jews, some Asian cultures, and certain First Nations do not believe that brain death alone constitutes death. And Lazar writes that it's important for physicians to bear in mind some people who see a brain-dead loved one on life support will have difficulty accepting the fact of death.

Some bystanders might also worry that brain death has been declared prematurely so the organs can be harvested. But once medical staff have carried out a thorough, unhurried examination, says Lazar, families need to be told "in no uncertain terms that brain death is the equivalent of death of the patient."

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