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The quake doctor

'Crush syndrome' causes a second wave of death in the aftermath of an earthquake. An Edmonton kidney specialist is the crusader behind a global plan to save such victims

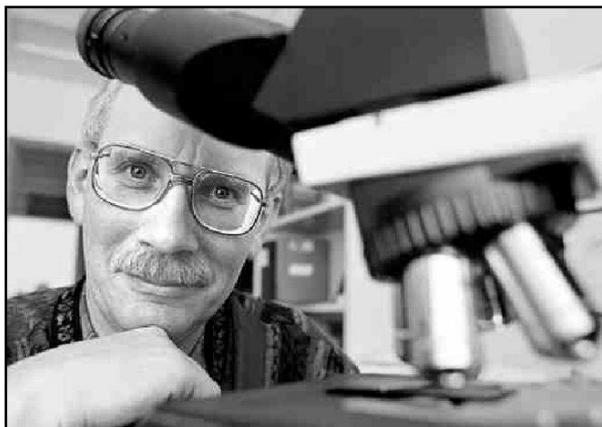
Brad Evenson
National Post

When he hobbles into Istanbul's glorious Blue Mosque, Ercan Ozan removes a shoe from his artificial leg, kneels, and thanks Allah for sparing his kidneys.

"I lost a limb, but Allah let me live," says the 24-year-old engineering student.

That may be so. But Mr. Ozan and 500 fellow survivors of the August earthquake in northeastern Turkey also owe their lives to a medical crusade begun a decade ago by a Canadian kidney specialist, Dr. Kim Solez.

"Crush syndrome" is a chief cause of death after an earthquake. It's a form of acute kidney failure set off when limbs are crushed in crumbling buildings, and it usually kills at least 50% of its victims.



John Ulan, National Post
Dr. Kim Solez is alerted by the U.S. Geological Survey, which measures seismic activity around the world, within moments of a major tremor.

And it's also the reason TV images of children saved after many days trapped in rubble are so deceiving, since these youngsters usually die later in hospital.

But thanks to Dr. Solez and an international team of doctors, a sophisticated, global plan to save such victims is now in place.

Mr. Ozan was one of its first successes.

On Aug. 17, Mr. Ozan was visiting his parents' house on the outskirts of Istanbul when the city was hit with a powerful earthquake, measuring 7.4 on the Richter scale. Suddenly, the concrete house collapsed, trapping Mr. Ozan amid its dusty ruins, his right leg crushed "like spongecake" beneath him for what seemed like days.

"The pain ... and the thirst ... were like hell," he recalls.

Suddenly a doctor -- an Israeli, he thinks -- appeared and stabbed a needle into his arm. Mr. Ozan blacked out. Although it only dripped a weak saline solution into his body, that intravenous needle was a vital first step in preventing Mr. Ozan's body from poisoning his kidneys.

"In Turkey, we had a reduction in mortality among the patients who had renal failure from the usual 50% to 15%," said Dr. Solez.

"So it was really a remarkable saving of lives."

A tall, balding man who seems to travel constantly, the Edmonton kidney pathologist has investigated mass poisonings of children in Haiti, opened renal units in many Third World countries, and linked kidney experts around the world in an Internet group called cyberNephrology. "He has a tremendous, persistent drive to help people," says Dr. Norbert Lameire, the Belgian head of the International Society of Nephrology's disaster relief task force.

But the earthquake work may be what Dr. Solez will be remembered for best.

In fact, Dr. Solez is one of a handful of people alerted by the U.S. Geological Survey -- which measures seismic events around the world -- within moments of any major tremor.

"You'd be surprised how often you get woken up in the middle of the night," he chuckles.

His earthquake campaign began shortly after he left Johns Hopkins Medical School for the University of Alberta, when Dr. Solez was thinking about forming a new medical society that would deal with acute kidney failure.

"It was Dec. 8, 1988, which was the date of the major earthquake in Soviet Armenia, and I suddenly realized there was one facet of this I hadn't really thought about -- the international aid these countries need when there's huge numbers of people who have renal failure."

When a body is crushed by a falling building, it sets off a catastrophic chain of medical problems.

First, crushed muscles release a huge amount of myoglobin, a protein that is injurious to the kidneys. The body goes into shock, lowering blood pressure to harmful levels. There is "third space fluid loss" -- swelling that removes fluid from the blood. And finally, red blood cells begin to break down, releasing haemoglobin, which also injures the kidneys.

Crush syndrome was virtually unknown until the mass bombing campaigns of the Second World War. It is the reason major earthquakes are invariably followed by a huge second wave of death by organ failure two to three days after the initial shock.

This second wave was sweeping across Armenia in the wake of the 1988 earthquake, which killed over 50,000 people, when an urgent call went out for kidney support.

"We are losing people because we haven't got the equipment," an angry Dr. Emma Kostina told reporters in the capital, Yerevan.

"If you write anything, tell them to send us equipment."

Within days, the World Health Organization swung into action. A week after the quake hit, planeloads of doctors, dialysis machines and other equipment arrived to help ease the burden, a multi-million-dollar effort.

It was one of the most ineffective relief efforts in history.

"It all arrived much too late," says Dr. Solez.

"Nobody knew how to use it, they didn't have the power and water for it, and so not a single patient who had renal failure as a consequence of the earthquake was successfully looked after."

In fact, the rescue effort made things worse.

The chaotic influx of unco-ordinated aid created a kind of second disaster clogging transportation channels, slowing response to the original disaster and wasting an enormous amount of resources.

Appalled by the blunders, Dr. Solez set to work creating a worldwide program that would actually save someone. His plan appeared five years later, in a 1993 article in the journal *International Kidney*. The group he chaired, the Acute Renal Failure Commission, joined up with Doctors Without Borders, to ensure a kidney expert would be on the first plane into a disaster.

"They don't wait for someone to invite them, they just go," laughs Dr. Solez.

It took years to put together the plan, which ensured an adequate water and power supply, infection control, technical support and rapid deployment. Several minor quakes in Turkey gave the kidney program a chance to work out a few flaws.

But when the telephone call from the U.S. Geological Survey came on Aug. 17, the plan was ready.

This time, the first Doctors Without Borders plane that entered Turkey within 24 hours of the earthquake had a nephrologist. Nurses, technicians, haemodialysis machines and filters followed within 36 hours. North American and European doctors were in contact with Turkish kidney experts, ready to analyze pictures of kidney tissue sent over the Internet -- another of Dr. Solez's pet projects.

"We used many new techniques we have learned," said Dr. Lameire, who recently replaced Dr. Solez as head of the acute kidney failure group.

"For example, when a person is pinned by wreckage, we attach an [intravenous] bottle of saline solution to keep the body's fluids up," he says.

"If we wait until the victim is freed, it may be too late."

This technique saved Mr. Ozan, who does not remember rescue crews prying his unconscious body loose from the wreckage, or when exactly it was doctors amputated his leg. (There was no family member who could give medical consent; his parents' bodies were found a week later in the ruins of the house.) "The doctors put me on an ... artificial kidney machine," said Mr. Ozan, who spent several weeks in hospital, and continues to undergo rehabilitation to help him walk. "I am a fortunate man. So many others died."

Dr. Solez doesn't try to take much credit for his role, stressing he did not go to Turkey himself. "My role in this was to get the plan to work, write about it and get the larger organizations to accept the plan," he says.

In the meantime, the peripatetic doctor has been busy in Kosovo, sorting out ways to restore kidney medicine to hospitals in the region devastated by a decade of Serb control, then a war with plenty of bombing -- and, hence, kidney disease. "It's a difficult situation there," he says with typical understatement.

"But I think there are a few things we can help them with."

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