

Opinion: Disagreeing on the definition of death

By Ariane Lewis

How can you truly know when someone is dead? Historically, death was determined by holding a mirror up to a person's mouth to see if they were breathing. But this method was not foolproof, so safety coffins outfitted with a string attached to a bell were used to allow someone who woke up after burial to easily send out a distress signal.

Today, the most commonly accepted definition of death is irreversible cardiopulmonary arrest—when a person no longer has a palpable pulse, an audible heartbeat, or sounds of breathing. The lesser-known definition is the time when a person's entire brain irreversibly stops functioning. While these conditions can be clearly and conclusively determined, an inconsistent patchwork of laws about death has made it possible to be dead in one state and not in another. Treating death as if it is negotiable has affected everything from how we allocate medical resources as a society, to the way we show respect for the dead and their families.

Death by neurologic criteria, or brain death, was originally described in the United States at Harvard in 1968, in response to advances in cardiopulmonary resuscitation (CPR) and ventilators that allowed a patient's heart and lungs to continue working independent of brain function. The Harvard criteria served as the foundation for the currently accepted medical guidelines for determination of brain death in the United States.

Almost 50 years later, most Americans have no idea what brain death is. While large-scale public awareness campaigns exist to help people identify signs of a heart attack or a stroke,

there has been no public education about brain death. People commonly think of Nancy Cruzan, Karen Ann Quinlan, or Terri Schiavo when they consider brain death because of their highly publicized court cases about the right to die. Although these women had severe brain injuries, they were not brain-dead—they were in vegetative states, alive but unconscious. While a person in a vegetative state still responds reflexively and is able to breathe, this is not the case for people who are brain-dead.

Determining brain death is more complex than the relatively simple process of checking for a heartbeat, pulse, and sounds of breathing. First, doctors have to make sure that the person has an irreversible brain injury, and no medications such as sedatives or abnormal lab results might falsely suggest that they are irreversibly unresponsive. Medical staff then normalize body temperature and blood pressure and do a series of clinical tests. They apply pressure to the forehead, fingers, and toes to see if the patient responds. If the patient is unconscious, they assess for the presence of reflexive brainstem activity. They touch the corneas to see if the eyes blink and shine a light in the eyes to see if the pupils constrict—both normal signs of brainstem activity. Doctors also touch the back of the throat to find out if this triggers a gag or cough, then move the head back and forth and inject water into the ear canal to see if either results in normal eye movements.

If there is no evidence of brainstem activity, they move on to the final test, the apnea test. The doctor takes the patient off of the ventilator for eight minutes to see if they breathe. If the carbon dioxide level in their blood rises to a level that should force them to breathe, but they do not take any breaths, the test is consistent with brain death. If part of the examination cannot be completed (as is the case with injuries to the face or neck), medical staff perform a secondary test to either confirm that no blood is flowing to

the brain or that there is no brain activity.

The process to declare brain death is detailed and arduous because no distinction is as important as the one between life and death. Although the heart can continue to beat for weeks or months (or in extremely rare cases, years) if organ support is continued, cardiopulmonary arrest generally occurs shortly after declaration of brain death. No one has ever recovered from brain death when medical society guidelines for determining brain death were correctly followed.

After the Harvard paper was published in 1968, 27 states legally acknowledged brain death as a form of death. However, because it did not make sense for a person to be dead in one state but alive in another, President Jimmy Carter and Congress asked the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research to evaluate the definition of death. In conjunction with the American Bar Association, the American Medical Association, the National Conference of Commissioners on Uniform State Laws, and a number of religious officials, this committee of experts in bioethics, epidemiology, health economics, law, medicine, nursing, philosophy, public health, research science, and sociology created the Uniform Determination of Death Act (UDDA) which states: "An individual who has sustained either 1) irreversible cessation of circulatory and respiratory functions or 2) irreversible cessation of all functions of the entire brain, including the brainstem, is dead. A determination of death must be made in accordance with accepted medical standards."

Brain death qualifies as legal death in all 50 states, but patients' families do not routinely perceive brain death as the equivalent of cardiopulmonary death. Some refuse to accept that death can occur while the heart is still beating or want to believe that recovery is possible. Hospitals handle some of these objections internally, but others wind up in court, which can take a long time to resolve.

Religion offers one legal path to postponing declaration of death or discontinuation of organ support after brain death. Most religious leaders embrace the concept of brain death, but in some cases, families cite religious beliefs for rejecting a diagnosis of brain death. As a result, California and New York require hospitals to provide “reasonable accommodation” to these religious objections. Similarly, Illinois asks physicians to “take into account the patient’s religious beliefs” when determining time of death. All three of these states’ guidelines about managing religious objections are vague.

Two states offer clearer guidelines. In New Jersey, if a family objects to brain death on religious grounds, physicians must await cardiopulmonary arrest before declaring death. The only other state that provides guidance about management of objections to brain death is Nevada, whose definition of death was revised in October 2017 to declare that: 1) determination of death is a clinical decision and does not require permission from a person’s representatives; and 2) the cost of continuing organ support after brain death may be the responsibility of a person’s representatives. Nevada was the first state to address the financial aspects of continuing organ support for a brain-dead patient. It costs upward of \$5,000 a day to maintain a brain-dead patient, and insurance companies do not routinely cover this cost, so if a family does not pay it out of pocket, the hospital needs to cover it.

These varying guidelines leave the meaning of death unsettled. Consider the 2016 case of Israel Stinson, whose mother objected to discontinuing organ support after he was declared brain-dead in California. She stated that her Christian faith led her to believe that he could be healed, and the court mandated that the hospital continue support while she sought to have him transferred to a hospital in New Jersey to take advantage of that state’s religious exemption. She was unable to find an accepting hospital in New Jersey, or anywhere else

in the U.S., so she ultimately brought him to an institution in Guatemala. But three months later, she decided to bring him back to California. The case then went back to court, and the hospital received permission to discontinue organ support.

Although the values of autonomy and religious freedom are important, negotiations about death have consequences for not just individual patients, but families, medical teams, and society. Continuing organ support for a person who is brain-dead can be seen as disrespectful abuse of a corpse. Families can suffer complicated grief when the pronouncement of death is delayed or organ support is continued after brain death. Healthcare teams that are legally forced to continue organ support for people who are dead experience moral distress. Society as a whole is affected by these conflicts because resources that could be devoted to living patients with the potential for recovery are provided to people who are dead.

Until the public better understands the finality of brain death and objections to this condition are met with identical responses throughout the country, death will, in some ways, remain uncertain.

Ariane Lewis is a neurologist who specializes in critical care at NYU Langone Medical Center.

Stabbing at Y sends 1 to jail, 1 to hospital

One South Lake Tahoe man is in jail and another at Barton Memorial Hospital recovering from non-life threatening stab wounds.

Kifer Chriss, 57, who local police know by multiple aliases, was booked into the local jail on an attempted murder charge. The 27-year-old victim was in stable condition following the Jan. 27, 5:30pm incident at the Y transit center.

"It's unclear what the altercation was over at this time," Officer Matt Morrison told *Lake Tahoe News*.

It is not known how many times the victim was stabbed or where. A knife has been recovered, but details about it have not been released.

Good Samaritans held the suspect down until officers arrived. They were there waiting for a bus. It's not known if the two involved in the knife fight were loitering or waiting for a bus.

"The best involvement is to be a good witness and be able to safely report what you are seeing to the police," Morrison said. "Fortunately, our Good Samaritans today were uninjured."

The transit center doors have been locked since last April because of vandalism and homeless people sleeping there. In **March 2017**, four people were involved in a stabbing at the transit center.

– *Lake Tahoe News staff report*

**Breeding super-nutritious
crops to help solve global**

hunger

By Heather Ohly and Nicola Lowe

An incredible 155 million children around the world are chronically undernourished, despite dramatic improvements in recent decades. In view of this, the UN's Sustainable Development Goals include Zero Hunger. But what do we understand by the word hunger?

It may refer to lack of food or widespread food shortages caused by war, drought, crop failure or government policies. But as researchers, we are particularly interested in a different kind of hunger – one that is less visible but equally devastating.

Micronutrient deficiencies, also known as hidden hunger, occurs when there is a lack of essential vitamins and minerals in a person's diet. This condition affects more than 2 billion people globally, and can contribute to stunted growth, poor cognitive development, increased risk of infections, and complications during pregnancy and childbirth. The wider impacts of micronutrient deficiencies socially and economically are also well established.

Supplementation and food fortification have long been used around the world to alleviate micronutrient deficiencies. Both strategies boast high cost/benefit ratios. But as they require repeated investment, their sustainability is limited. Supplements may be used to treat multiple micronutrient deficiencies, but this is a resource-intensive approach and does not address the cause of the problem – dietary inadequacy.

Food fortification, on the other hand, improves the nutritional quality of food itself. Here, micronutrients are added to commonly consumed foods at the processing stage. This strategy can be implemented at population level, and does not

require individuals to change their eating behaviours.

In the UK, for example, flour has been fortified with calcium since World War II, when a reduced supply of dairy products was anticipated. Today, many of our foods are fortified, including bread, cereal products and fat spreads.

In developing countries, food fortification has gained momentum in recent years through the work of organizations like the Global Alliance for Improved Nutrition (GAIN). Large scale food fortification programs have enhanced the micronutrient content of a range of staple foods in over 30 countries. For example, the GAIN/UNICEF Universal Salt Iodization Partnership has protected 466 million people in 14 countries against the debilitating effects of iodine deficiency – such as mental impairment and goitre, a swelling in the neck resulting from an enlarged thyroid gland.

But one major disadvantage of food fortification is that some of the poorest families may not have access to commercially processed foods. And it is these remote rural communities – that grow and process food locally – that are often the most affected by hidden hunger.

Going one step further

An alternative approach is to add micronutrients at the agricultural production stage. This approach, known as biofortification, uses conventional plant breeding techniques to enhance the micronutrient concentration of staple crops. This is achieved by cross-breeding standard varieties with their wild relatives, over several generations.

This innovative strategy was first developed in the 1990s, and is now pioneered by an organization called HarvestPlus, which is supported by the UK Department for International Development. HarvestPlus has focused its efforts on iron, zinc and vitamin A – identified as the three most prevalent micronutrient deficiencies globally.

Biofortified crops include: vitamin A maize, vitamin A cassava, vitamin A sweet potato, iron beans, iron pearl millet, zinc rice and zinc wheat. These crops have been introduced into many countries in Africa, Asia and Latin America. And HarvestPlus aims to reach 100 million people with biofortified crops by 2020.

Biofortification has several advantages over food fortification. After the initial investment to develop the biofortified seed, it can be replicated and distributed without any reduction in the micronutrient concentration. This makes it highly cost-effective and sustainable. Biofortified crops are also often more resilient to pests, diseases, higher temperatures and drought – essential qualities as many countries become increasingly susceptible to climate change. And perhaps most importantly for nutrition, biofortified crops reach the world's poorest and most vulnerable people.

Each new biofortified crop requires meticulous development and evaluation to ensure the micronutrient concentration is sufficient to make a significant impact on nutritional status, and that farmers and consumers will adopt the new biofortified varieties. Research has shown high levels of consumer acceptance, especially when information and awareness campaigns were implemented.

At the University of Central Lancashire, in partnership with international collaborators, we are currently investigating the impact of biofortified zinc wheat in a rural community in northwest Pakistan – where more than 40 percent of women are zinc deficient. The diet is very limited in this community but wheat flour is used every day to make chapattis.

The zinc concentration of the soil is very low and this provides an opportunity to experiment with “agronomic biofortification”, or the application of zinc enriched fertilizer. Our study will determine the cost effectiveness of these combined strategies.

Of course, biofortification is a partial solution, which must go hand in hand with efforts to reduce poverty, food insecurity, disease, poor sanitation, social and gender inequality. But it has the potential to contribute to the eradication of hidden hunger, and the UN's aim to end all forms of hunger and malnutrition by 2030.

Heather Ohly is a postdoctoral research assistant in nutrition at the University of Central Lancashire. Nicola Lowe is a professor of nutritional sciences at the University of Central Lancashire.

Letter: Kirkwood lends a hand at B&B

To the community,

Since 1989, Bread & Broth has been serving free hot dinners to thousands of diners every year. Beginning in 2010, the Adopt A Day of Nourishment program was put into place to encourage individuals, churches, organizations and business to join B&B in providing these needed meals as a service to the community.

Thanks to the commitment of Vail Resorts and funding from its EpicPromise grant program, Kirkwood Mountain Resort hosts six Adopt A Day dinners annually. Sponsoring their first AAD of 2018, Kirkwood hosted the Jan. 23 Monday meal and sent Cara Bourne, Shayne Carlson and Reba Mourao from Kirkwood's ski school team to volunteer alongside the B&B volunteers to pitch in with the dinner service and bring their wonderful people skills to welcome and cheerfully serve the dinner guests.

After packing food giveaway bags and working the serving line, Mauraao shared her feelings about the evening's experience. "It was an enjoyable experience being able to interact with our local community and the volunteers who regularly dedicate their time. It is heartwarming to see how much food and time is donated to make a filling dinner every Monday and to see the filled 'take home' bags."

B&B would like to thank Kirkwood for their \$300 donation to cover the meal's food, supplies and utility costs and encouraging their wonderful team members to give of their time and effort to help others is our community.

Carol Gerard, Bread & Broth

Outdoor gear sales slip as millennials drive shift in habits

By Dan Elliott, AP

DENVER — Sales of outdoor equipment are slipping as millennials drive changes in U.S. consumer habits by favoring clothes and sporting goods that are less specialized and more versatile, analysts say.

Industry retail sales totaled \$18.9 billion from December 2016 through November 2017, down 6 percent from the previous 12 months, according to NPD Group, a market research company that tracks trends in two dozen industries.

The company announced the numbers this week as manufacturers

and buyers gathered in Denver for the Outdoor Retailer and Snow Show, the industry's biggest winter marketplace.

Read the whole story

NHP increasing patrols targeting impaired driving

From Feb. 1-15, drivers in Northern Nevada can expect to see double or even triple the normal law enforcement presence.

The Nevada Highway Patrol has joined forces with law enforcement agencies statewide to crack down on impaired driving

According to the NHP, "Impaired driving not only puts your life and the lives of others in danger, the cost of driving under the influence is high. The average estimated cost of a DUI when legal fees, court fines and higher insurance rates are considered is over \$10,000."

The enforcement will be in Washoe, Carson, Douglas, Lyon and Storey counties.

Joining Forces Program is paid for by Nevada Department of Public Safety, Office of Traffic Safety.

Water companies to convene to discuss PCE

South Tahoe Public Utility District, Lukins Brothers Water Company, and Tahoe Keys Property Owners Association are hosting a public meeting Feb. 7 to discuss the groundwater contaminant tetrachloroethylene, PCE, found in groundwater at the Y area.

This will be an opportunity to find out what the local water agencies are doing about it. This is important because all of their customers use groundwater.

Here is a column about the issue from last fall from Lukins.

While it was stated at the City Council meeting this week that PCE has reached the lake, STPUD and Lahontan Regional Water Quality Control officials after that meeting said that statement was not true.

"PCE has not been detected in the lake," Doug Smith, assistant executive officer with Lahontan, told *LTN*.

STPUD provided this statement to *Lake Tahoe News*, "The known plume of PCE has entered the groundwater below the Tahoe Keys lagoon area. The PCE contaminated samples in the Keys area are from two of the Tahoe Keys Water Company public water supply wells. This means the samples are from a depth of approximately 100 feet below ground surface. If the water in the lagoons or the lake were sampled, PCE would not be detected. We are conducting an ongoing study of the PCE contamination at the South Y area with partner water agencies to control the spread of PCE and begin removal of the contaminant, design a treatment system, or identify potential alternate sources of water for Lukins and the Tahoe Keys Water Companies. Lahontan Regional Water Quality Control Board is conducting an ongoing investigation of Lake Tahoe Laundry

Works, a potential responsible party. Lake Tahoe Laundry Works is also conducting onsite treatment of PCE.”

In 1989, PCE was found in drinking water wells near the intersection of highways 50 and 89. PCE remains in groundwater and forms a contaminant plume believed to cover more than 400 acres. PCE is a man made chemical that was used from the early 1960s through the mid-1980s as a solvent for dry cleaning clothes and degreasing metal.

The meeting will be from 6-7:30pm in council chambers at Lake Tahoe Airport.

– Lake Tahoe News staff report

State of Jefferson event on West Slope

The State of Jefferson County Committees of El Dorado, Nevada and Placer’s Assembly of Patriots will be Feb. 11 at the American Legion Hall in Placerville.

Doors open at 2pm, the event begins at 3pm with guest speaker Mark Baird of Siskiyou County. Kicking off the event will be Terry Rapoza, co-host of Jefferson State of Mine radio show, on KNCR radio in Shasta County.

Admission is free and all ages are encouraged to attend.

Jefferson merchandise, information, snacks and beverages will be available.

Hikers give USFS static over radio plan for Jobs Peak

By Benjamin Spillman, Reno Gazette-Journal

A proposal by the Humboldt-Toiyabe National Forest to install a new radio repeater has raised the ire of hikers who say it would be a blight on an iconic Nevada peak.

The proposal calls for a 20-foot tower on a five-foot-high metal building on top of Job's Peak, a 10,633-foot-tall peak located eight miles southwest of Minden.

The solar-powered repeater would improve reliability of radio communications for Forest Service workers in the Carson Range, which towers over Carson Valley to the northeast and Lake Tahoe to the northwest.

Read the whole story

Anderson returns to top of X Games podium

By Karen Price, Team USA

Jamie Anderson of Meyers crashed on her first run in the slopestyle snowboarding competition at X Games in Aspen, Colo., on Friday, but the reigning Olympic queen never stays down for long.

Anderson came back and threw down a second run that included a big front side 720 and cab double cork 900 to score 94 points and overtake teammate and reigning X Games champion Julia Marino at the top of the podium.

The most decorated slopestyle snowboarder in X Games history now has five gold medals and 14 overall at the competition, finishing on the podium in every single X Games slopestyle event she's ever entered.

Read the whole story