



SciJourney

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Through Journalism

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The Heartbreak of Potter's Syndrome

BY RACHEL POOL

Fort Zumwalt North High School

Heather Nelson, age 23, had a very stressful pregnancy, chasing after her two-year-old daughter and worrying about keeping her unborn baby as healthy as possible. Worse yet, she wasn't able to have the fun of planning for the new baby to come home and buy new baby clothes. Nelson was facing every mother's worst nightmare, worrying about how she is going to explain to her young daughter why her new baby isn't coming home and planning her unborn child's funeral.

In the fifth month of her pregnancy, Nelson was told that her baby was going to be born without kidneys—a rare and fatal condition known as Potter's Syndrome. "Every time I hear of another baby being diagnosed with Potter's Syndrome it just breaks my heart. But I know that God chose each one of us mothers, we are the Earth's angels, chosen to carry these special babies to the arms of Jesus," Nelson tells *SciJourney*.

Fetuses afflicted with Potter's Syndrome lack one or both kidneys before birth, according to potterssyndrome.org, a website run by a mother who lost a child to the syndrome. Having your kidneys in the womb is very important, because they are fundamental for the production of amniotic fluid. The amniotic fluids expand the womb around the embryo and help it form into a fetus. Without the amniotic fluid; the womb remains petite, thus leaving the baby's lungs undeveloped.

Most babies with Potter's Syndrome are stillborn, but the ones that aren't, usually live for only one or two days after birth because of undeveloped lungs that make it hard for the baby to breathe, according to

potterssyndrome.org and information on the Minnesota Department of Health website.

Males have a higher chance of getting Potter's Syndrome because they have a higher rate of another problem, Eagle-Barrett Syndrome—poor development of the abdominal muscles, causing the skin of the belly to wrinkle, according to emedicine.medscape.com, a medical reference site run by WebMD.com.

Potter's Syndrome is not a single problem. There are four different types of the syndrome now recognized, with different causes, according to potterssyndrome.org.

There is not much known about the cause of the syndrome. Scientists suspect that it may be linked to the formation of the gonads—testes in males and ovaries in females. The tissue that gives rise to the gonads and the kidneys is the same for females and males. In fetuses, the testes and kidneys form at the same time but the ovaries form after the kidneys, according to potterssyndrome.org.

The physical features of babies that are diagnosed with Potters Syndrome are flattened noses, recessed chins, low-set ears, Eagle-Barrett Syndrome, stretchy skin and limb anomalies, says emedicine.medscape.com.

"I saw a daddy out on a Valentines 'date' with his young daughter back in February, it was so sweet," recalls Nelson. "But it broke my heart. That could've been me, I could have taken Rhyan out on a mommy and son 'date' for Valentines. I may never get to take my son out for Valentines Day, but I do have the privilege of saying my Valentine this year is an angel..."

Earthquake in Haiti



JERRICKA COTTON

Pictured is a seismograph, which is used to measure earthquakes. According to Saint Louis University Earth Sciences Professor Keith Koper, seismographs, such as this one, can detect major tremors all the way from China, including the 2010 earthquake in Haiti.

BY ADEOLA ADEWALE

YES SciJourn Journalist

In January, 2010, an Earthquake hit Haiti, one of the poorest countries in the world, killing thousands and devastating millions.

What caused this? A 7.0 magnitude earthquake happened inland, about 16 miles from Port-au-Prince and 8.1 miles deep along the Enriquillo-Plantain Garden fault system.

The quake was felt in Port-au-Prince and its suburbs. In addition, it was felt in several surrounding countries and regions, including Guantánamo, Cuba; Kingston, Jamaica; San Juan, Puerto Rico; and the bordering country of the Dominican Republic. This earthquake was even felt as far as Caracas, Ven-



SAVANNAH ARNOLD

What's more dangerous: the sport or the field you play on?

Playing in Blood, Sweat, & Saliva

BY SAVANNAH ARNOLD

Fort Zumwalt North High School

Football players may have something more than being tackled to worry about. A synthetic turf playing field could be dangerous, say some experts. Others dispute the claim.

A synthetic turf field on a 98 °F day will reach a temperature of 173 °F, whereas a natural grass field will reach a high of 105 °F, according to experts in the Department of Plant Science at the University of Missouri-Columbia. Even the air above the synthetic turf is smoldering at a whopping 138 °F. The sizzling temperature is not the only problems that athlete playing on synthetic turf might face.

Others claim that many medical problems have sprouted from the use of this man-made grass substitute. According to Brad Fresenburg, a Turfgrass Specialist at the University of Missouri-Columbia, the most common injuries on synthetic turf are muscle strains and skin abrasions.

Other risks are being debated, says Fresenburg. Fresenburg was quoted by Applied Turfgrass Science, a company supportive of natural grass use, in November 2005. "Natural grass has a microbial system. It is self-cleaning," he says. "The synthetic fields don't have that. There's warmth. There's moisture. Bacteria can thrive in there. There's sweat, spit, and blood."

If the turf is not cleaned properly, bacterial infections can pose a colossal threat to athletes. Fresenburg suggests using a disinfectant used in hospitals, such as Re-Juv-Nal HBV. But some turf managers just use a 10% bleach solution.

According to Fresenburg, athletic trainers at the University of Missouri-Columbia demand all students who experience a "turf burn" have it cleaned and treated to prevent a worse abrasion. "The biggest threat of field materials is the infill material that may cause eye abrasions if a player rubs their eyes too much with crumb rubber or sand in them," Fresenburg stated.

Ron DeMeyer, a representative for Mondo U.S.A. Inc of Conshohocken, PA, an artificial turf manufacturer, denied all of the claims. DeMeyer says "that injuries on turf are no different than what happens on natural grass." Studies based on the playability of the surface during rain, and other bad weather, show that turf is actually safer than grass, he tells *SciJourney*. "You will have a safe playing surface where injuries are less likely to happen."

There are no hazardous materials in our Mondo Turf System," adds DeMeyer. "There have been stories about lead being found in artificial turf recently." However, these were in first generation fields like the old 'Astroturf' that was used in the St. Louis Cardinal's Busch Stadium back in the 1980's. "Mondo Turf fibers are made polyethylene with no heavy metals."

DeMeyer also claims that "there is no problem with bacteria in artificial turf." When a turf field drains, the water will go through the perforated holes in the back of the carpet. This will "clean" the field and does not allow water to "pool" or "puddle". "Finally, bacteria cannot survive under [ultraviolet light]. So, once the sun comes out any bacteria that may be in the turf will be killed."

ezuela, which is a staggering 659 miles away.

According to estimates from the U.S. Geological Survey, a federal source for science about the Earth and its natural and living resources, natural hazards, and the environment, approximately 3.5 million people lived in the area that experienced shaking intensity of VII (very strong) to X (disastrous). This is a range that can cause moderate to very heavy damage even to earthquake-resistant structures.

According to the BBC, the death toll caused by this quake has reached 150,000 and is still rising.

The quake occurred in the vicinity of the northern boundary where the Caribbean tectonic plate shifts eastwards by about 0.79 inches per year in relation to the North American plate.

Basically Haiti and other parts of the Caribbean are the only areas along the eastern coast of the North and South American continents that

are experiencing active plate tectonics. They are surrounded predominantly by even denser oceanic plates that are either pushed under the Caribbean Plate, or are sliding past it in what geologists call a strike-slip boundary. The tectonics Caribbean Plate extends from the eastern portion of the Caribbean island across Latin America to its western boundary, where the plate is consuming the Cocos Plate. Because the Caribbean Plate is thicker and more buoyant than normal oceanic plates, it behaves as a continental plate – floating on top of the thicker plate and melting them away.

The strike-slip fault system in the region has two branches in Haiti, the Septentrional in the north and the Enriquillo-Plantain Garden fault in the south.

The location of the fault system suggest that the earthquake was caused by a rupture of the Enriquillo-Plantain Garden fault, which had been locked for 250 years, gathering stress.

Hunting Proves Both Profitable and Crucial

BY BRANDON TAPPEMEYER
Fort Zumwalt North High School

“Hunting is necessary to keep the deer herd at a healthy level,” Missouri Department of Conservation wildlife biologist John Vogel tells *SciJournner*. “Without hunting, you could see a variety of effects ranging from a largely diseased deer herd to deer running all over the road and getting hit by vehicles.”

Experts say that deer are a vital part of the ecosystem.

However, their vitality is balanced by their destructive force. As Vogel explains, “If a deer herd becomes too vastly populated, the chance for spreading diseases increases dramatically.” Along with the increased deer herd that would come with no hunting, deer diseases would be more common. “The most prevalent

diseases in Missouri are the Blue Tongue disease and the Chronic Wasting Disease, both of which are fatal,” comments Vogel. “The insects that spread those diseases would have more hosts to prey on.”

“A good density of deer that would be able to withstand such a disease infestation would be about 25 deer per square acre,” Missouri Regional Wildlife Supervisor Joel Porath explains. “About 300,000 deer are killed annually by hunters in Missouri. If hunting was eliminated, you would have about 300,000 more deer crossing the roads, making the chances for [a car] hitting a deer go up dramatically.”

Deer hunting also represents a large amount of

money that goes into the economy each year. As Vogel points out, “There is more than \$1,000,000 that hunters spend in Missouri. That ranges in everything from equipment, to clothing, to gas, to food, and even lodging.”

“In the entire United States,” Porath adds, “the total amounts in the billions, and without it, many businesses wouldn’t see a rise in consumer spending from about the middle of October on.”

Another positive impact that hunting has on the economy is through *Share the Harvest*. It is a program through which hunters donate their kill to food pantries. The meat processors that participate in *Share the Harvest* are U.S. Depart-



ANDREW TAPPEMEYER

The author next to a deer shot in St. Charles County, MO.

ment of Agriculture inspected, insuring that the meat is properly handled. “In 2007, 320,000 pounds of venison were donated in Missouri alone,” John Vogel explains, “That is nearly 800,000 meals for needy families.”

“If hunting was banned, several events would occur,” says Vogel. “The population would be able to sustain itself for a while. The reproduction would increase, as would the popula-

tion. Eventually the habitat would lose a large amount of underbrush due to the deer eating it all. The animals, which required that type of vegetation to live, would end up being very scarce. The forest would have a low diversity of vegetation due to only mature trees not being eaten. In the end a lack of food and the high possibility of an epidemic of diseases would be the demise of the deer herd.”

Blocking Traumatic Memories



DAMONTE JOHNSON

The drug propranolol shows promise as a traumatic memory eraser.

BY BETH KIENTZLE
Incarnate Word Academy

Could scientists really make traumatic memories disappear?

Recently, scientists have shown that using a drug called propranolol could decrease these disturbing memories. Bryan Hercules, a local pharmacist in St. Louis who owns his own store under the *Medicine Shoppe* name, thinks that the drug does not necessarily block out the memory completely, but simply calms the patient down by slowing the heart rate when they think about it.

Propranolol is typically prescribed to lower blood pressure. This drug is a beta-blocker, which reduces heart rate. Scientists think that propranolol helps with traumatic memories because it slows the patient’s heart rate, and they no longer get agitated when the memory is recalled.

Researchers suggest taking propranolol soon after an incident occurs that could lead to post-traumatic stress disorder (PTSD) might prevent permanent traumatic memories altogether.

PTSD is a disorder that develops after being faced with a devastating situation in which damage is done either physically or mentally. Some of these situations might include war, rape, any kinds of crashes or abuse. Common symptoms of PTSD include difficulty sleeping or focusing, depression, suicidal behavior, headaches or chest pains, anxiousness or outbursts of anger.

William J. Cromie, a journalist from the *Harvard Gazette*, wrote in 2004 that a national study shows that an estimated 8% of the U.S. population develops PTSD at some point.

According to The Healia Team, who run a consumer health website initially developed by an award from the National Institutes of Health (NIH), tests have been performed to show that the drug propranolol is a good way to calm the heart rate while patients think of the memory that haunts them.

One study Healia.com describes involved showing 60 people a picture of a spider. Half were given a mild electrical shock while they were looking at the picture. When all the participants were exposed to the picture again, the shocked patients showed fear while the others did not. The researchers gave some of the people who were afraid of the picture propranolol and showed them the image again. The researchers found that these patients were less startled and showed little or no fear, even when the propranolol was out of their systems.

Healia.com explains this

result by pointing out that each time a memory is recalled, it is “stored” in the brain differently than the time before. This is known as “reconsolidation”. When propranolol is given to these patients, it interacts with this process and helps the brain to no longer associate that memory with fear.

Age may also be a factor. Researchers at Friedrich Miescher Institute for Biomedical Research in Switzerland have carried out tests on rats to see if they can erase the animal’s fears. The study, published in 2009, found that baby rats forgot their fear more easily without any drugs than the adults. Joseph LeDoux, a professor of neuroscience at New York University, told National Public Radio that rats and humans are similar when it comes to fear.

Propranolol is consumed by mouth and should be taken at the same time every day. The drug can cause dizziness, tiredness, upset stomach, rash or problems with using the bathroom, according to the website MedlinePlus, which is run by the National Library of Medicine and NIH.

“This drug is very safe for people that don’t have certain types of heart problems,” says Hercules. He says the drug would be beneficial if the patients are screened carefully. Also, he pointed out that this medication was used for stage fright, which could have led researchers to see if it would be successful in treating traumatic memories.

Cochlear Implant Controversy

BY CASEY JAEGER
Fort Zumwalt North High School

Cochlear implants (CIs) are designed to help deaf adults and children who get little or no benefits from hearing aids. According to the National Institute on Deafness and Other Communication Disorders (NIDCD), in 2009 there were about 188,000 people worldwide with CIs. In the U.S., about 41,500 adults and over 25,500 children have a CI.

A CI is a surgically implanted electronic device that provides a sense of sound to a person who is profoundly deaf or hard of hearing. According to Advanced Bionics, a worldwide manufacturer of CIs, a microphone picks up the sounds, which then go through the transmitter located behind the ear. The transmitter sends the sound through the receiver to electrodes implanted in the cochlea, a structure located in the inner ear. The cochlea then transmits the sound to a nerve leading to the brain.

Deaf people lack the hair cells in the ear that allow normal hearing. The hair cell is what helps the normal hearing people send sounds to the nerve then to the brain.

Despite the advantages, there is a lot of controversy over getting a CI in the deaf community. According to Mary Koch, an auditory education consultant who started the children’s rehabilitation program at Johns Hopkins’ Listening Center, the medical world and the deaf world were split at the outset. “The [deaf community’s] perception is that there’s nothing wrong [with being deaf]. There’s nothing that needs to be fixed. Our perception is, there is something that needs to be fixed. So from the very foundation, we’re diverging in our perspectives,” Koch told CBS News in 1998.

The conflict in the deaf community is described manualism versus oralism. Manualism describes people who use sign language; oralism represents those who only speak.

Those opposed to CIs have many reasons. Parents choose to give a child a CI; the child does not get to pick their mode of communication. A child with a CI would not need to sign anymore and some people fear that sign language will vanish. Others think deafness is not a disability, that it is a cultural identity.

Those who support implants think deaf people should be mainstreamed into the hearing world. People who support CIs believe that normalization is the key to success for deaf children. They believe refusing to implant deaf children is unethical when it can be effectively fixed.

According to Matt, an 18-year-old student with a CI, it is easier to have a CI because you can hear everything. It is easier to communicate with hearing people instead of using sign language, especially when working on a job.

Michelle, a deaf adult without a CI, says sign language is extremely visual and can be improvised to add humor, imagination and personality.

NIDCD is researching ways to improve the benefits provided by CIs by studying ways to make sounds clearer.

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