THE INTERNATIONAL HYPERBARICS ASSOCIATION, INC.

The Pressure Point

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Inside this issue:

Educational Blurbs

Hyperbaric Healing: Inflammation 101

What is inflammation?

Inflammation is a process by which the body's white blood cells and chemicals protect us from infection and foreign substances such as bacteria and viruses.

In some diseases, however, the body's defense system (immune system) inappropriately triggers an inflammatory response when there are no foreign substances to fight off. In these diseases, called autoimmune diseases, the body's normally protective immune system causes damage to its own tissues. The body responds as if normal tissues are infected or somehow abnormal.

Cytokines

Cytokines are proteins that are secreted by various types of immune cells and serve as signaling chemicals. The central role of cytokines is to control the direction, amplitude, and duration of the inflammatory response.

There are two main groups of cytokines: (table 1) *pro-inflammatory* and *anti-inflammatory*. Pro-inflammatory cytokines are produced predominantly by activated immune cells such as *microglia* and are involved in the amplification of inflammatory reactions. Anti-inflammatory cytokines are involved in the reduction of inflammatory reactions.

Pro-inflammatory cytokines	Anti-inflammatory cytokines
IL-1	IL-4
IL-6	IL-10
TNF-Alpha	IL-13
TGF-Beta	Table 1

Prostaglandins

Prostaglandins are produced in most tissues of the body and have varying actions. They are short-lived, hormone-like chemicals that regulate cellular activities on a moment-to-moment basis. Prostaglandins fall into 3 series - *PG1*, *PG2*, and *PG3*. PG1 and PG3 are known to have anti-

(Continued on page 8)

A breath of fresh air

By Jacob Belcher

January 25, 2007—For 76-year-old George Kilnapp of Marshfield, donning a pair of scrubs and surrendering 2 1/2 hours out of his day to sit in a dimly lighted tank to receive an oxygen treatment at the Hyperbaric Oxygen Treatment Center in Randolph really wasn't a part of his agenda until recently.

Kilnapp was diagnosed with a malignant tumor two years ago on the left side of his upper back, and after removal of the malignancy at Jordan Hospital in Plymouth and 26 intense radiation treatments at the South Suburban Oncology Treatment Facility, the problem cleared up.

However, the treatment left Kilnapp with a quarter-sized hole and a 3 1/2-inch deep wound that wasn't healing on its own. It required 50 stitches, and his wife of 57 years, Louise, had to change the dressings daily.

After Louise was unable to take care of her husband's wound because of her own illness last year, which George thinks was caused by the stress of taking care of his wound, he found a private visiting nurse to help out with the dressings, but he still didn't see any real progress in healing to the wound with a portable devise used to suck out or remove infectious materials

Kilnapp, who has to wear the device at all times,

(Continued on page 6)

Heartwise Hyperbaric News

Cedar Hill HS student Ciera Trevino makes remarkable comeback in both soccer and life

By Loyd Brumfield
Cedar Hill TODAY

January 21, 2007—Heather Parks thinks about Ciera Trevino for a moment, wondering what her future might be like.

"I really do believe the sky's the limit for her," the Cedar Hill High School girls soccer coach said. "Every day I see improvement with her, whether it's foot skills or touch on the ball. Every day she finds something that she does a little bit better than the day before."

Ciera, a junior, is in the midst of a remarkable comeback. Not just in soccer—but in life.

She was nearly killed by a little-known and little-understood genetic disorder as a freshman during volleyball practice when she suffered a sudden cardiac arrest.

Her father, Eddie, a Dallas firefighter and former paramedic, was there and was instrumental in saving her life.

The arrest, brought on by a rare condition known as *Sudden Arrhythmia Death Syndrome ("SADS," or Long QT Syndrome)* left her in a coma in the short term as her parents dealt with the fact that not many children survive the affliction—which stems from an electrical problem in the heart.

Ciera didn't just survive. She's thriving again.

And when the Cedar Hill girls soccer team took to the pitch for their first scrimmage Jan. 5 against Saginaw Boswell, she returned to what she loves doing the most—playing competitive soccer.

"Just seeing her on the field again was awesome," Parks says with wonder.

"It was emotional, too," Eddie says.

Ciera Trevino

"I know she had been waiting a long, long time for that night to come," Parks says.

Ciera was the best player on the team as a freshman and was listed as one of the best 100 players in the nation in her age category. Her return gives the Lady Longhorns a dynamic weapon—but she's far from being 100 percent.

"I'm at about 30 percent now," she says quietly.

At her peak she could bounce a soccer ball in the air 812 times before it would fall. She can do it five times now.

Eddie and his wife Alice had a remarkable support group of family and friends during Ciera's long road back, and several fundraisers generated a lot of money to go toward medical bills where insurance fell short.

But once it was clear that Ciera was going to survive the initial incident, it dawned on the family just how much had to be done still.

"The arrest was brought on by a rare condition known as Sudden Arhythmia Death Syndrome…

…her parents dealt with the fact that not many children survive the affliction"

Starting over

"We didn't realize how bad it was going to be until a year later," Eddie says.

The condition left Ciera with short-term memory loss that she still battles today. She could remember things that had been a permanent part of her life before her disorder struck—who she was, who her family was—but momentary details would elude her.

"A week from now she might not remember talking to you," Eddie says. "She had to relearn everything—how to speak, how to read, how to walk and how to go back to school."

Ciera was reading "Harry Potter and the Half-Blood Prince" before her SADS condition hit home. She was on page 373, Eddie says.

She has since finished the book and several others, but learning to read again wasn't easy.

"It was very confusing," Ciera says. "I didn't even know what reading was."

She picked up the Potter book again while in rehab, and it took her an hour to get past one page, Eddie says.

Eddie had to rehabilitate himself in the process. As someone who never liked to read, he found himself teaching sitting down with his daughter and reading to her, helping her to relearn that skill.

She also worked with a teacher who had a stroke and and had to learn how to read again.

Eventually, Ciera started getting better.

"She could remember what she had read at the end of the chapter. She just couldn't remember actually reading it," Eddie says. "But soon she was asking me to come up with more review questions and she wanted me to read more.

"Then she started reading on her own again."

Eddie was in charge of math and science at home, while mother Alice taught her English and history.

In the chamber

As part of her rehab, Ciera spends time in a hyperbaric chamber on a regular basis—an enclosed chamber that suffuses her body with oxygen pumped in at a higher level than air pressure.

One of the chambers in Dallas comes with a videoscreen so she can watch movies during the 90-minute session.

Many of the films come with subtitles, which forces her to read again.

In addition, Eddie and Alice soon found out that Ciera's short-term memory improved substantially after each session in one of the chambers.

What's it like spending all that time in an enclosed, cramped space like that?

"It's comfortable," Ciera says with a mild laugh.

During her recovery, Ciera was fitted with an internal defibrillator that regulates her heart. While she's been cleared to play soccer again, she has to be careful about manual labor and hard contact, which could possibly damage some of the defibrillator's wiring, Eddie says.

Her soccer skills returned naturally—she never forgot how to play—but she's still relearning other things.

"She can jump rope now if two people hold both ends of the rope," Eddie says. "But she can't do it if she has to hold the rope herself."

Ciera also was an accomplished swimmer before her cardiac arrest.

'Glug-glug'

"She took a lot of lessons and was part fish," Eddie says. "When she came out of the hospital, she knew she could swim and said, 'Oh, I know how to do this,' but when she got in the water, she went 'glug-glug' and sank like a rock."

Now she's swimming again, a little bit, Eddie says.

"She gets frustrated if she can't do something right away," he says.

Ciera has an aide who helps her get around school, but she can manage most of it on her own, she says. One of her major goals is to graduate with her original Class of 2008.

"The challenge now is for her to stay on top of her academics," Parks says of Ciera, who was the top-ranked student in her class as a freshman.

"When Ciera did something, it was always at 100 percent, whether it was soccer, whether it was school or anything else. She didn't know how to do things at less than all-out effort."

> **"Ciera's short-term memory improved substantially after each session in one of the chambers."**

Now she has to pace herself slowly after being cleared to play soccer just in time for the season to start.

The goal-setter

"Her cardiologist told us her heart's fine and back to normal," Eddie says. "He worried a little bit about the wires getting crossed in her ribs and shoulder blade. Lifting is a concern, and she has to watch out for full-body contact."

Ciera's parents were worried about her road back to sports, but she decided on her own to come back.

"Once she sets a goal, she achieves it," Eddie says.

She played competitively over the summer in an indoor league and worked out on her own in preparation for her junior season at Cedar Hill.

> **"The Trevinos are overjoyed to have their daughter back"**

"We never thought she'd get released (to play), so she's way behind on her conditioning," Eddie says. "The other day she ran a mile in about 10 minutes at a jog."

The Trevinos are overjoyed to have their daughter back.

"Not many people her age survive this, but she did," Eddie says, adding that Ciera is classified at QT1, which is the mildest form of Long QT Syndrome. "At QT3 and 4 it's usually a recurring problem, but the mild form that Ciera has can be corrected" through beta-blockers and other measures.

Ciera played for about 45 minutes total during Cedar Hill's second scrimmage of the season against Little Elm and played well, Parks says.

Her home debut was scheduled to come Jan. 16 against Mansfield.

Ciera's outlet

"A lot of kids who have this get depressed and struggle to get by because they don't have an outlet," Eddie says. "Ciera was lucky in that she always had soccer."

And success in soccer should lead to success in other areas like academics, Parks says.

"I really think soccer can be a trigger for so many other things," she says. "If she can do this, she can do anything."

Ciera is more than happy to rejoin her teammates.

"I felt happy again when I started playing," she says. "It's one dream I was hoping to get back to."

Parks is happy to see her back, too.

"She could never forget about that black-and-white ball," she says. "You know what else is going to be something? When she scores that first goal."

Warning Signs:

- Family history of unexpected, unexplained sudden death in a young person
- Fainting (syncope) or seizure during exercise, excitement or startle
- Consistent or unusual chest pain and/or shortness of breath during exercise

remember

Most cardiac problems that may cause sudden death in the young can be diagnosed and treated, allowing for a normal productive life.

Stem Cell/ Hyperbaric News

Bringing Tori back:

Utah teen going to China for stem-cell treatment

Grandmother Sandy Schmanski, left, and dad Tim Schmanski aid Tori Schmanski. Tori was brain-injured in a car accident.

By Alison Snyder, Deseret Morning News

Jan 8, 2007—A 30-hour flight to the other side of the world is the least of what the Schmanskis will do for their daughter.

Especially if it will bring her back.

On Wednesday, Tim and Maria Schmanski will travel with their 16-year-old daughter, Tori, to Hangzhou, China, where she will receive stem cell treatment over a 32-day period at a Beike Biotechnology clinic.

"We're just trying to get more of the old Tori back," Tim Schmanski said.

One day can change everything

On June 19, 2005 —Father's Day —Tori was in a car with her younger sister and two cousins when the car rolled two times and landed upside down in a canal. Despite the water filling the interior, Tori was able to push her sister and cousin out of the submerged car but was not able to get herself out and remained trapped underwater for 15 minutes until rescuers arrived.

Tori had to be resuscitated twice on her way to the hospital. Her brain went without oxygen for an estimated 25 minutes, Tim Schmanski said.

Tori survived, and life has never been the same for the Schmanski family. Tori has brain damage—an anoxic brain injury, to be exact—leaving her unable to speak, eat or move her limbs. Her parents spent nine months with her in the hospital as she battled pneumonia, digestive problems, seizures and vomiting, switching nights sleeping in a chair at her side.

Neighbors, friends and family rallied to support the Schmanskis. Tori was a member of The Dance Club, an Orem-based dance company. It has dedicated competitions and donated proceeds of dance concerts to the Tori Schmanski fund. Many other donations to the fund through Tori's Web site (www.pray4tori.com) have been used to supplement health insurance for Tori's medical care. The Lindon-based company *For Every Body* has recently reintroduced its "Pray 4 Tori" candle to help fund the trip to China.

"If it wasn't for all the generous people who donated to the Tori Schmanski fund, I don't think this would have happened," Tim Schmanski said.

> **"Tori has brain damage— an anoxic brain injury, to be exact— leaving her unable to speak, eat or move her limbs.**
>
> **…She's kind of trapped in her body, as we see it."**

A different life

After the grief, the hospital and the change, the Schmanskis adjusted to life with a different Tori.

In March 2006, the Schmanski family was able to bring Tori home. Maria Schmanski quit her job as a travel consultant to become a full-time caregiver for Tori. Her days revolve around her daughter's needs. She said it takes 2 1/2 hours to get Tori ready for each day, from giving her medication to a head-to-toe sponge bath. She said she doesn't like to go further than 10 minutes away or leave Tori with someone else.

"She's unpredictable," Maria Schmanski said. "I don't want to put someone in that position. She has seizures, anxiety attacks, sudden pains, vomiting."

Life definitely has been different, Maria Schmanski said.

"It's stressful," she said. "Tori can have a lot of anxiety, and it can rub off on you. She can get upset because she can't tell you what she needs."

Tori's days are spent watching—watching her younger brother and sister play games from her wheelchair, watching the Utah Jazz with her dad and grandpa, watching TV from her bed, watching movies with her brother, watching family photos change on a laptop screen saver.

Sandy Schmanski, Tori's grandma, also helps out, reading picture books and gossip magazines, updating Tori on celebrities such as Nicole Richie and Justin Timberlake. She has a card game she plays with Tori, too: She holds up two cards. Tori looks at both, then focuses her gaze on the correct answer to Grandma's question. In one instance, Sandy Schmanski holds up two cards, one with "Orem" written on it, the other with "Salt Lake City"

"Where do you live, Tori?" Sandy Schmanski asks. Tori knows. She lives in Orem.

"How do you say 'hello' in French, Tori?" she asks. *Bon jour.* Tori knows.

"I think if she could effectively communicate, she would shock us," Tim Schmanski said. "We are drawing more and more out of her. She's kind of trapped in her body, as we see it."

The Schmanskis take Tori to physical, speech and occupational therapies every week. They've researched and tried all sorts of therapies, treatments and medicines to help Tori, including hyperbaric oxygen treatment, where she was put into a chamber and pressurized oxygen was forced into her body. It loosened her muscle tightness.

"That alone is big," Tim Schmanski said.

But it isn't enough, which is why they're going to try to get the old Tori back.

> **"They've researched and tried all sorts of therapies, treatments and medicines to help Tori, including hyperbaric oxygen treatment…**
>
> **It loosened her muscle tightness."**

Sandy Schmanski, left, goes through a magazine with granddaughter Tori. Tori responds with eye movements or changes in breathing.

The 'old Tori'

The Schmanskis describe the old Tori as beautiful, charismatic and full of life. She was a snowboarder and an avid dancer, talented in jazz, hip hop and ballet. She loved the color orange and eating pizza and spaghetti. She was a "nonstop texter" and she started building Web pages on the Internet when she was just 8 years old. She was smart; as a sophomore in high school, she was taking four college-level classes. She wanted to be a doctor, wanted to attend Stanford University.

Younger sister Whitney, 12, and Tori have a lot in common. Whitney, like Tori, is also a talented dancer and member of The Dance Club. She said they both love shopping and iPods. She remembers dancing together and a dance trip to MGM Studios at Disney World.

But things are different now, even though Tori still wears orange shirts and orange socks with monkeys on them and still likes the same music and movies as before. Whitney said it's different because they can't talk to each other. Though they still love her, they all miss the old Tori. Including Tori.

"You can tell when she's sad," Maria Schmanski said. "If she sees something she really misses" she "voices out, (a) kind of moan."

For example, a while back, Maria Schmanski said Tori , while watching the "So You Think You Can Dance" TV show, saw a dance friend and made a whole lot of noise.

Now, the Schmanskis have different dreams for Tori than being a doctor and a dancer, and stem cell treatment is a way they hope will realize those dreams.

"We're willing to try most everything, as long as it's not too dangerous," Tim Schmanski said.

A journey to China

What the Schmanski trip to China may bring is well worth the trip, they say. Tori and her parents will fly to Washington, D.C., then Paris, then Shanghai, China, afterward driving to Hangzhou, where a Beike Biotechnology clinic and research facility is located. Throughout their 32-day stay, doctors will inject Tori's spine with 10 million stem cells every five or six days—50 million in all—that will hopefully become new brain cells.

Stem cells can be used to replenish many different cell types within the body, according to the National Institutes of Mental Health Web site. The Schmanskis hope the stem cells, when combined with the brain's natural tendency to repair itself, will help Tori recover.

Tim Schmanski said they found out about stem cell treatment and the clinic through online research, specifically through the Web site www.stemcellchina.com. In early 2006, they began talking to other families whose family members have had the same procedure and have seen some positive results—the kind the Schmanskis hope to see in Tori: more awareness, better control of her body, more effective communication and improvements in eating and swaddling.

"There's even people who have been paralyzed for 20 years that are moving and feeling their feet," Tim Schmanski said. "There's no guarantee, but the vast majority have seen results."

Tori will receive adult stem cells taken from an umbilical cord instead of embryonic stem cells, which come from destroyed embryos. It is a treatment that is not widely available in the United States.

Embryonic stem cell research is a hot issue in politics. However, Tim Schmanski said they did not make a decision based on moral reasons, but chose the adult stem cells because not enough research has been done on embryonic stem cells, which may cause tumors and other problems. He said there are "too many unknowns" with embryonic stem cells, and he thinks more research is needed on the subject.

"I think that in this country we need to federally fund both embryonic and adult stem cell research," Tim Schmanski said. "We don't have enough data on embryonic stem cells to really know what they can do."

He said that if the treatment works, they won't be against doing it again. "Our hope is that the next time we do this, we won't have to go to China," he said.

Tim Schmanski is hopeful about the effects the treatment may have on Tori. "I'd like to see her walk again," he said. "I'd like to see her have a better quality of life."

Maria Schmanski has different expectations. "I hope it helps," she said. "I don't expect a miracle. Even just something little, like eating better or communicating more."

Just a little bit more of the old Tori back.

Left: Shawn Austin recuperates at Presbyterian/St. Luke's Medical Center after suffering severe frostbite while walking to his Calhan home Sunday. He was outside for 20 minutes.

Right: Dr. Grace Doherty makes sure her patient, George Kilnapp of Marshfield, is comfortable before she prepares the hyperbaric chamber for his oxygen treatment in a Hyperbaric Oxygen chamber.

Slog home amid whiteout could cost man a finger

By Felisa Cardona
Denver Post

January 16, 2007—Shawn Austin clutched the St. Christopher medal he wears around his neck as he trudged on foot through deep snow in whiteout conditions Sunday night.

Austin was on his way to Calhan from work at the Olive Garden in Colorado Springs, where he is a cook, when his Jeep got stuck in a snowdrift, just a half-mile from his home.

Because he had jogged the distance before, 26-year-old Austin believed he could make it home without too much trouble, despite the howling wind and snow.

He never thought the 20 minutes he spent outside could give him frostbite in his hands and fingers or put him in a hyperbaric chamber at Presbyterian/St. Luke's Medical Center.

> **“The hyperbaric chamber…provides Austin with extra oxygen in a pressurized chamber to improve blood flow to his hand tissues”**

The hyperbaric chamber—more commonly used to treat carbon-monoxide poisoning—provides Austin with extra oxygen in a pressurized chamber to improve blood flow to his hand tissues.

While Austin is in danger of losing a finger and may have lifelong problems using his hand, Dr. Bill Clem, Austin's physician at St. Luke's, said the prognosis is hopeful.

"I think he will live to cook again," Clem said.

During Austin's treacherous walk, he fell several times in the snow and used his hands to get back up. He wasn't wearing gloves, just boots, a coat and a hat.

"I got to a point where I wouldn't take my hands out of my pocket, but I had no choice but to keep going," Austin said Tuesday from his hospital bed.

Austin made a cellphone call to his mother, Laura Schutts, and told her where he was. She drove her truck outside to meet him at the end of the driveway just in case he had trouble.

"My heart was in my stomach because I could hear him, but I could not see him," Schutts said about searching for her son. "I thought I was about to lose a child."

She found Austin and put him in the truck and drove him the rest of the way home. She warmed him up, and he got into a bath to raise his body temperature.

By 7 a.m., a helicopter was on its way to fly him to the hospital in Denver after he discovered his hands covered in blisters.

Austin wants his injury to be a warning to people who think they are just making a quick trip to the store or from the car to the house in severe weather.

"Anyone can get into this situation," Austin said. "I was just a half-mile from home. It can happen really quick."

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Breath of Fresh Air (continued)

described the device as a stinging, burning sensation that wasn’t completely helping.

Through the recommendation of a doctor last year, however, George decided to look into hyperbaric oxygen treatments, where patients spend 2 1/2 hours in a 10-foot long by 6 ½-foot wide chamber to receive pure oxygen to aid in the healing of wounds caused mostly from radiation treatments from cancer and other difficult healing wounds.

Kilnapp, who is on his 59th treatment, said he and his doctors are starting to see definite shrinkage in the wound. He describes himself as claustrophobic, but said spending the long amounts of time in the chamber doesn’t bother him, and he even gets some free water and crackers out of the deal.

Kilnapp does call the treatment “a day-croaker, and that part is a little hard,” but he is happy to see the treatments starting to work.

Dr. Grace Doherty, head of the Hyperbaric Oxygen Treatment Center in Randolph, has treated more than 6,000 patients since the center opened in February with high success rates. The oxygen chamber, which was originally used to treat divers for decompression sickness, is helping patients treat a variety of diseases, especially diabetes, and according to Doherty dramatically increases the odds of healing.

“It’s tremendously satisfying to see wounds heal after patients have been cured from their cancer, but are left with devastating radiation wounds from their treat-

(Continued on page 8)

Stem Cell Research News

Richard Branson Launches Virgin Stem Cell Bank

Catharine Paddock
Medical News Today
01 Feb 2007 - 11:00 PST

Sir Richard Branson at the launch of Virgin's stem cell bank.

> *"I'm absolutely passionate about the possibilities of stem cells, which is why I'd like to make sure the future benefits are open to everyone," Branson said.*

UK—Virgin founder Sir Richard Branson has launched a dual private and public blood bank of umbilical cord blood as a source of stem cells to help treat donors or their families and other people who might need it.

Sir Richard said in a BBC radio interview earlier today that he got the idea for the project a number of years ago when he was visited by a senior director of the National Blood Centre asking for his support in a charitable role because children were dying through lack of umbilical cord blood.

Initially Sir Richard offered 3 million pounds to the National Health Service to help them increase their storage capacity for umbilical cord blood, but this was not something the NHS was comfortable with, accepting funds from private sources. So Sir Richard decided to set up a company to do the job.

On the BBC Radio 4 programme Sir Richard outlined his plan to set up a commercial enterprise within the Virgin group of companies to store and sell cord blood. He said that the profits of the company would go to a charity to be set up to help groups, particularly ethnic minorities, who have difficulty sourcing cord blood because there are not enough samples that match them.

Other companies are already offering cord blood storage on a commercial basis, and thousands of UK couples have used them. The cost of storing a batch of cord blood is in the range of 1,500 pounds.

The Virgin scheme however would be unique because "we will take an individual's cord blood and we will divide it in two," said Sir Richard, and added that "part of it will go into a national blood centre that anybody can get access to. And the other half will be put aside for the child."

Cord blood, which is "harvested" just after the baby is born, is a rich source of stem cells which can be used to treat serious and life threatening diseases such as leukaemia.

Some experts are predicting that storage of stem cells in this way could one day help treat the donor, or close matched patients, for degenerative diseases that they might suffer from much later in their lives such as Parkinson's and Alzheimer's.

Some people are saying that while the idea of collecting cord blood is a worthwhile one and no-one wants to deny a person, especially a child, the opportunity for life saving treatment, one also needs to take into account the practicalities of how to collect cord blood without interfering unduly with the process of labour and giving birth.

Cord blood is collected in two ways. One way is while the placenta is still in the uterus just after the baby has been delivered (in-utero) and the other way is just after the placenta has been delivered (ex-utero) where it is placed in a special cradle with the umbilical cord hanging down to make it easy to withdraw the 75 centilitres or so of blood that is necessary for a viable sample.

The National Health Service currently takes about 2,000 donations a year from mothers who want to donate cord blood to help others.

Once treated as a waste product of birth, cord blood is now considered an important resource, and numbers of private and public sector cord blood banks have been increasing since the late 1990s, both in the UK and the US.

Cord blood transplants have successfully treated a number of blood and immune system diseases, for instance leukaemia and Fanconi's anaemia, a rare genetic disease associated with a range of bone growth disorders including short stature, tumours and bone marrow failure.

Virgin Health Bank

More information on Stem Cells (NIH, US)

American Association of Blood Banks

How it Works

Umbilical cord blood is left in the placenta after birth. It is extracted by inserting a small needle and drained. The procedure can be carried out as soon as the cord is cut, while the placenta is still in the womb. Alternatively, the blood can be collected after the placenta has been delivered and taken to a sterile room.

The cord blood is processed and the stem cells concentrated into a 25ml sample for storage in liquid nitrogen. This is divided into a 5ml sample for the child and a 20ml sample to be stored in the public bank.

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"Mundo vitam dare"

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The International Hyperbarics Association, Inc., is a coalition of doctors, parents, patients, corporate chamber-industry professionals, hyperbaric center owners, and above all members who are committed to the cause of medical hyperbarics.

Our members come to us from all geographical areas with one common goal— to share their knowledge and information regarding the latest hyperbaric news. Our driving force is our members, who are committed to do all we can "to give life to the world."

— **"Mundo vitam dare"**

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Inflammation 101 (continued from page 1)

inflammatory effects as they decrease inflammation, increase oxygen flow, prevent cell aggregation, and decrease pain. PG2 are known to have pro–inflammatory effects, since their effects are opposite to those of PG1 and PG3.

Because of the negative effects of chronic inflammation, it is speculated that people with inflammatory diseases would most likely benefit from an increase in Series 1 and 3 prostaglandins and a decrease in Series 2 prostaglandins.

Table 2 shows a comparison of the effects of the different prostaglandins.

Table 2

PG_1 and PG_3 (anti-inflammatory)	PG_2 (pro-inflammatory)
Decrease pain	Increase pain
Increase oxygen flow	Decrease oxygen flow
Dilate airways	Constrict airways
Decrease inflammation	Increase inflammation

101

The role of hyperbaric oxygen

Hyperbaric oxygen causes vasoconstriction of blood vessels, which actually causes decreased blood flow. However, because it increases the amount of oxygen in plasma so much, the overall result is increased oxygen delivery to tissue. Because it causes decreased blood flow, HBOT decreases swelling, including swelling in the brain, after injury or ischemia. In fact, it is many times more potent than Motrin (i.e. 2.4 ATA 100% O_2=200mg/kg Motrin)

In essence, hyperbaric *oxygen* inhibits stimulus-induced pro-inflammatory cytokine synthesis by human blood-derived monocyte-macrophages. It suppresses inflammatory cytokine release as measured by IFN-gamma production following mitogen stimulation.

A breath of fresh air (conclusion)

(Continued from page 6)

ments," he said.

The pressure from the increased amount of oxygen in the chamber is the equivalent to being under 45 feet of seawater, according to Doherty, who monitors the patients as well as the oxygen and pressure levels in the tank during the treatments.

Doherty said patients are not scared of the treatment, just bored. Patients are able to watch movies or read books to help pass the time. Since the chamber can usually hold four people, Kilnapp says he has met some nice people who have come and gone during his days at the center.

"I've met some nice people, and have had some good brief friendships, but the people I have met have had medical situations worse than (my) own," he said.

Kilnapp's health insurance covers his hyperbaric treatments, but Doherty said there is still a need to cover other problems such as stroke or autism in which the chamber is also believed to help.