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Brain Sciences Center

The origins: A million dollar baby

Today, the Brain Sciences Center at the VA Medical Center in Minneapolis, run in collaboration with the University of Minnesota, is considered one of the leading-edge research facilities in the world – particularly for brain problems that involve veterans.

Studies on PTSD and other brain disorders have been published in dozens of worldwide medical journals, and the center is now breaking new ground on research into Gulf War Illness and aging.

But there was a time when the Brain Sciences Center was only an idea, and a scary one at that.

Past National Commander Dan Ludwig of Red Wing was there at the beginning, and he told some of the Brain Science story in an interview.

First of all, he said, you can trace the story back to the connection that was established between the VA hospitals and the medical schools in the late 40s under the direction of Gen. Omar Bradley, the World War II

PNC DAN LUDWIG

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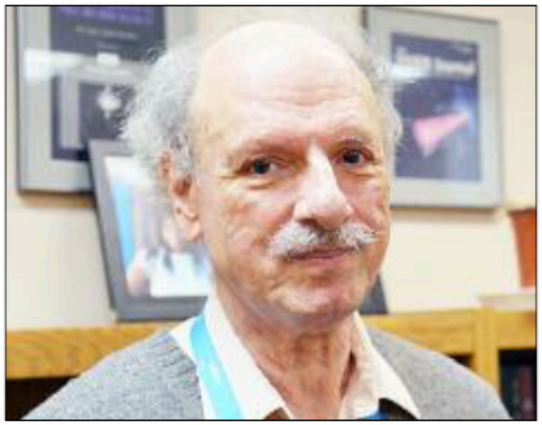

DR. APOSTOLOS GEORGOPOULOS

The leadership: The doctor from Athens

The Brain Sciences Center at the Minneapolis VA began 27 years ago as empty rooms and adventurous ideas.

Dr. Apostolos Georgopoulos was hired in 1991 to be the American Legion Chair of Brain Science at the University of Minnesota. The Legion raised $1 million to create the chair, and the sum was matched by the University of Minnesota.

Georgopoulos was a researcher at Johns Hopkins in Baltimore at the time, and he actually had three job offers – innesota, Southern California and New York University. His research was focused on how the brain could control pros-

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What it's done: PTSD to Gulf Illness

The Brain Sciences Center at the Minneapolis VA Medical Center has been in the forefront of international research into PTSD for many years, and one of its leading scientists recently gave a run down on what we know about the disease.

Dr. Brian Engdahl, the William L. Anderson Chair in PTSD Research, gave the 25th annual American Legion and University of Minnesota Lecture in Brain Sciences in November.

Engdahl said descriptions of PTSD (Post Traumatic Stress Disorder) have been recorded for over 4,000 years, going back to the Sumerian culture. In Napolean's army, the disorder was called "nostalgia" and was so severe in some soldiers that they curled up into a ball, in the fetal position, and refused to fight.

"One of the cures was to bury the soldier up to the neck in the ground and to shame him. That was not helpful."

In the Civil War it was sometimes called "soldier's heart" because one symptom was the racing of the

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DR. BRIAN ENGDAHL

Dr. Georgopoulos

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thetic limbs.

Eventually, Minnesota was chosen. "For my wife and me, it was a new adventure. It was a lot like going out to the Wild West."

The new Brain Sciences Center was only a concept. "It was an opportunity to start something totally from scratch," Georgopoulos said. "We had a blank slate."

He paid tribute to Robert McDivitt, who is now director of the VA Midwest Health Care Network, and Tom Mullon, who was director of the Minneapolis VA for key help at that time.

"It was moment to moment, day to day trying to implement our ideas. It taught me how to make things happen."

The annual American Legion and University of Minnesota Brain Sciences Lecture was inaugurated two years later. "We've had the best in the world give the lectures, including two Nobel Prize recipients."

In the late 90s, Sen. Pete Domenici, R-New Mexico, was seeking ways to put federal money into studying the brain. Georgopoulos was one of those on a panel charged with what would be the best way to achieve real results. Georgopoulos, who had worked with magnetoencephalography at Johns Hopkins and knew the machine had tremendous potential for brain study, recommended buying MEGs, which cost several million dollars each, for researchers.

Domenici got his grant, and one day Georgopoulos got a letter saying that Minnesota, along with Harvard and the University of New Mexico, had been chosen to receive MEGs. "We hadn't even applied."

The arrival of the super brain scanner began a new era at the Brain Sciences Center. "It was a dream. It started work in all kinds of things."

The MEG, with its ability to detect minute magnetic changes in the brain, could see brain activity. "There are 100 billion cells in the brain, and it's the interaction that's important. It's how cells talk to each other to create a movement."

Through the years, the Brain Sciences Center has done research on PTSD, a condition suffered by many veterans, along with research on Alzheimer's, Parkinson's, alcoholism and other brain diseases.

With the MEG, the researchers at the center have been able to definitively see PTSD in the brain.

"We have been doing a lot of things, some bigger than others. We have done things that are very fundamental, and maybe not flashy."

Published examples of the research done with the MEG and other devices put the Brain Sciences Center on the map worldwide for innovative research.

A regret, he said, is that the VA medical system has never tried to apply the MEG research, particularly on PTSD, in a clinical setting.

As the years have gone by, the center has changed. "But we'll always be veteran-centric with benefits to the rest of humanity."

Over the years, Georgopoulos, who is now a Regents Professor at the University, has had job offers from Harvard, Yale, and his old employers Johns Hopkins. But in every instance, he has stayed in Minneapolis. "Looking back, if I had gone anywhere else, we couldn't have made all of this happen."

At the present time, the Brain Sciences Center has shifted gears again. Two major focuses these days are Gulf War Illness and the Minnesota Women's Healthy Brain Aging Project.

Georgopoulos said the center is shifting to biology to study Gulf War Illness. "Our studies of PTSD have shown that it's not a psychological problem, but a biological disorder."

Research has shown that it's likely GWI, which affects over 30 percent of Gulf veterans, can be blamed on the heavy array of vaccinations the troops received before going overseas.

Biological research, Georgopoulos said, has shown that some veterans may be lacking certain genes that could fend off the damage done by the vaccinations. It's possible that antibodies can fight the effects and bring healing to some veterans.

The research has also shown that the GWI could make the brain more vulnerable to PTSD. It has been shown that Gulf War veterans have a high rate of PTSD.

The aging project, under the supervision of Dr. Lisa James at the center, is studying how parts of a gene can affect the shrinkage of the volume of the brain in older people.

Georgopoulos said he has no intention of retiring. "There's always something new. It's exciting, and I don't want to leave anything unfinished."

AWARD WINNERS -- Two research assistants at the Brain Sciences center were the recipients of the American Legion Family Brain Sciences Award for 2018. The two will receive $1,000 each. From left: Eric Scuto, Don Thorpe, and Brain Sciences Foundation President Gary Olson, presenting the award at the annual Brain Science lecture. Scuto is studying the neurobiological functions of Gulf War Illness. Thorpe is studying the brain mechanisms of mild traumatic brain injury.

Origins of the Brain Sciences Center

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hero. Bradley saw that the Veterans Administration, which he led after the war, was not up to the task of taking care of the nation's veterans and he developed the university-VA connection.

The University of Minnesota and the VA have had a working relationship since 1948.

Another thread in the story, Ludwig said, was the fact that the Minnesota American Legion had successfully established a Heart Research Chair at the "U" in the early 1950s. Another half million dollars was raised in the 1970s.

In the mid-80s, Dr. Dick McGraw had an idea. "He was a World War II veteran, and a Legionnaire. He had this vision about a brain science professorship."

McGraw came to the Legion to see if they'd be willing to take on the project: Raise a million dollars to establish a brain science chair at the university.

"Nobody was opposed to the concept," Ludwig said. "But everyone was a little nervous about the million dollars."

An ad hoc committee was formed with Dick Saccoman from Pengilly as the chair and reports were brought back to the Department Executive Committee during 1985. Ludwig, who had been First District commander, was on the committee.

"I found it interesting, but the money really scared me."

At the Department Convention in 1986, the program was adopted in principal, but the committee was told to come back with concrete plans on how the money was to be raised.

Saccoman died, and George Ashwood of Minneapolis became the chairman. "It was the only time I ever lobbied to get on a committee, but I asked the incoming Commander Bud Redepenning if I could be on the Brain Science committee."

Ludwig's wish was granted, and the project moved ahead under Ashwood. And then Ashwood died of a heart attack.

Redepenning named Ludwig as the new chairman.

"We came to the Fall Conference that year, to the Executive Committee, to present the final plan. I was sicker than a dog.

"Dan Foley made the motion to approve, and provided the leadership to support the project. If he hadn't done that, it might have died right there."

Then the real planning began. A non-profit organization was created, and a committee of six Legionnaires and three Auxiliary members was named.

"Starting in January 1987, we met every two or three weeks at Sauk Rapids. We'd meet from six p.m. until midnight most times, and everybody was at every meeting. By the end of six months, we had the mission, the details, the awards, an honorary board, everything. It was a whole lot of good work."

Ludwig said the plan was so thorough, it never had to be retooled along the way. The only part of the plan that wasn't used was a contingency to go to corporations and other outside parties to complete the funding. The Legion Family raised every penny.

"I remember five different times during that year where we had meetings where over $100,000 was raised. It came in big chunks and in little donations from individuals."

In January 1989, the Minnesota Legion held its annual Blizzard Rally at Rosetown Post. "And that particular night, there actually was a blizzard. And so we had no one there from the west or the north."

The committee had raised $950,000 by that time. "We had $30,000 come in that night, including $10,000 from the Richfield Post. But before I could even announce the total, the commander from Richfield got the floor and asked how much short we were. I said $20,000. He came up to the podium and wrote out a check for $20,000. It brought Richfield's total contribution to $70,000.

"It was exciting times, I'll tell you."

Nothing happened for a time, and finally the University announced that it had formed a search committee to pick the new American Legion Brain Science Chair.

Ludwig was named to the committee in an advisory role.

Five finalists were chosen. "The discussion in the search committee was very heated. It damn near scared me."

In the end, a young researcher from Greece who had worked at Johns Hopkins for ten years was picked. Dr. Apostolos Georgopoulos has held the chair ever since.

"I didn't have a vote, but Dr. Georgeopoulos impressed the hell out of me. He was both competent and confident. But he didn't have a big ego."

Ludwig also paid tribute to two others in those early years, Dr. Neil Gault and Gordon Starr. "Gault and McGraw went to all kinds of Legion functions and talked about this vision. They got people fired up about it."

"And after every meeting, we'd have a to-do list, and that's what Gordon Starr did. He was like the 10th member of the committee."

Ludwig looks back at those days fondly. "I always tell people that whatever I've done in my life for the Legion – including being national commander — or for mankind, the Brain Science program was my finest hour.

"What we were doing at the time was still a mystery. We understood very little about the brain in those days. But we knew that whatever good we accomplished, it would be good. There was no qualification to that."

Dr. Engdahl

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heart. Treating the condition sometimes led to an addiction to morphine.

In World War I, it was often called "shell shock." In World War two it was called "battle fatigue."

"Some scientists think that the human body is actually wired to get PTSD," Engdahl said. "It can make you very vigilant, more careful going forward. Mother Nature doesn't care if you're comfortable, only that you survive and have children."

Engdahl said the condition wasn't officially recognized by scientists until 1952, when it was called a "gross stress reaction" by the American Psychiatric Association.

ERIC KALER
University President introduced Brain Science annual lecture

Through the years, more symptoms were recognized, but it wasn't until 1980 that the PTSD label was applied.

PTSD has been difficult to define because of its varied symptoms, and also because it often is combined with other problems such as alcoholism. Some standard definitions, though, include persistent painful memories which can be set off by triggers in life, hyperarousal and fear, and withdrawal from society.

There are certain factors that seem to cause PTSD in some including lack of social support, general life stress, poverty, a history of sexual abuse, low intelligence, mental disorders that run in a family, and gender.

Women are twice as likely to get PTSD as men.

Engdahl said in the 1970s when service people were coming back from the Vietnam War, it was just considered a normal reaction to a trauma. "You were told you should just get over it."

By 1980, as the research built a case for the disorder, The American Legion and the Disabled American Veterans fought to have Congress recognize PTSD as something the VA should treat, and it finally was.

A study of prisoners of war showed some interesting results, he said. Prisoners of Germany in World War II only showed about a 42 percent chance of getting PTSD, while prisoners of the Japanese, where camp conditions were much more harsh, developed PTSD at about an 82 percent rate.

PTSD, of course, does not just affect the military. "If trauma is severe and prolonged, most of us will develop PTSD."

As for treatment, Engdahl said providers "are trundling along."

He urged those who want to know about the efficacy of various treatments to go to the VA website.

Engdahl talked about how the Brain Sciences Center at the VA was a project of the Minnesota American Legion. "They went at it, and raised a million dollars. That was matched by the University of Minnesota."

One of the primary tools used by the center is a MEG (magnetoencephalography) scanner. "It's a concept that developed from anti-submarine warfare. The military wanted to be able to detect very faint magnetic signals at great distances."

The scanner has 248 sensors that look for magnetic activity in the brain, with such activity revealing communication in the brain. "All brain functions can be explained by communication."

He showed how scans can reveal such things as PTSD. "You subtract the normal brain functions, and what's left is what's wrong with the brain." The MEG can be used with other scanning devices, and PTSD can actually be mapped to certain areas of the brain. "When analyzed properly, we can see PTSD with great clarity."

In particular, there's an area in the right side of the brain, not far from the ear, that is a key "bio-marker" for PTSD.

The Brain Sciences Center has been recognized internationally for this research.

Research is also ongoing for Gulf War Illness. "The Gulf War in 1991 was considered a perfect war because it only lasted for 100 hours and we won. Yet, 30 percent of the veterans coming home reported symptoms of Gulf War Illness."

Recent research has shown that the huge amounts of vaccinations given by the U.S. to soldiers heading overseas may be a fundamental cause of GWI. Some soldiers, depending on their anti-immune systems, were more susceptible to the vaccinations having long-term adverse effects.

Additional research is being aimed at what can be done for people who have just experienced a major trauma in their lives. An injection of hydrocortisone has been shown to have a positive effect.

Engdahl thanked the Legion for getting the Brain Sciences Center started.