Novel helmet aids brain cancer treatment

Eileen Scahill | The Ohio State University Wexner Medical Center

An Ohio State patient diagnosed with brain cancer is among the first in the nation treated with a high-tech device that bombards the brain with electrical currents to kill cancer cells and to help control brain tumors that might otherwise be untreatable.

The 76-year-old Powell, Ohio, woman recently received this novel treatment at Ohio State’s Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC–James). A few months earlier, she was diagnosed with a dangerous type of brain tumor called glioblastoma.

Following surgery, chemotherapy and radiation, doctors gave her the electrical “helmet” she wears up to 18 hours a day that bombards her brain with electrical currents. At night, she plugs the device into the wall while she sleeps; during the day, the device is powered by battery packs. Patients say the machine is silent and easy to use.

“The electric currents interrupt the ability of cells to divide, causing their death and tumor shrinkage,” says Robert Cavaliere, MD, a neuro-oncologist at the OSUCCC – James. “The studies that have been performed suggest that this therapy is equivalent to chemotherapy in terms of outcomes.”

Glioblastoma, which is diagnosed in about 10,000 Americans each year, is both the deadliest and the most common form of primary brain tumor in the United States, according to the American Cancer Society.

Median overall survival time from initial diagnosis for patients with this type of brain cancer is 15 months with optimal treatment, and average survival from the time the tumor returns is only 3-to-5 months without additional effective treatment.

Novocure, a commercial oncology company, developed the device, which uses Tumor Treating Fields (TTF) therapy for patients with recurrent glioblastoma. Approved by the U.S. Food and Drug Administration in 2011, the device is being used only at 15 clinical centers nationwide.

Cavaliere says the device has slowed the growth of brain tumors and, in some cases, has shrunk them. In addition, the electrical currents that kill cancer cells don’t hurt healthy ones, and the device can work just as well as chemotherapy without serious side effects.

“Patients treated with chemotherapy frequently experience some nausea or vomiting, and they can have problems with bleeding and infections, but we don’t see those kinds of problems with this device.”

Learn more about how Ohio State is “creating the future of medicine to improve people’s lives” and share our accomplishments with friends and family at medicalcenter.osu.edu > News & Media Room.
Study may aid understanding of dyslexia

Even though cochlear implants have significantly improved the communication abilities of children with hearing loss, many of these children still lag behind their peers in language and literacy development.

For nearly 10 years, researchers at Ohio State’s Wexner Medical Center have followed more than 100 children with normal hearing or hearing loss, some since birth, to find answers that may lead to better implant designs and educational interventions.

A surprising picture is beginning to emerge from their studies that could change the way learning problems like dyslexia are detected and treated, say researchers.

“We’re beginning to see similarities between the language problems of some children with cochlear implants and the language problems of some children with normal hearing who encounter barriers to language learning,” says Susan Nittrouer, PhD, director of Ohio State’s Speech Development Lab and a professor of Otolaryngology.

“That’s enormously useful information because we know that the actual signal that children with cochlear implants get isn’t nearly as clear as the signal that normal hearing listeners get. So, if language and literacy problems in children with normal hearing are similar to those of deaf children with cochlear implants, maybe the difficulty rests with how they are processing the signal perceptually, even though they have normal sensitivity to sound. That would make sense since language was built on our perceptual capacities,” she explains.

With language development, timing is crucial. Most children with dyslexia, a language-processing disorder that impacts 5- to 20 percent of children in the United States, typically aren’t diagnosed until the third grade. By then, an important window of intervention opportunity has passed. Ohio State has conducted multiple studies to pinpoint this critical window.

Nittrouer’s team has identified some accurate predictors of future language and literacy problems in children with hearing loss by age 3.

“For example, a deficit in the early comprehension of spoken language is a strong predictor of later reading and writing problems,” explains Nittrouer. “Perhaps we’ll find that the measures of early language skill that we use with toddlers and preschoolers with hearing loss may actually identify children whose learning problems simply haven’t emerged yet. It would be ideal if we could step in earlier, and change the downstream impact.”

In a Perspectives on Language Learning and Education article (published by the American Speech, Learning and Hearing Association), Nittrouer suggests that some current theories of language development might need to be reconsidered, noting that the similarity of literacy problems in children with hearing loss and those with language deficits mandates taking a closer look at the role of perception in language development and new intervention approaches.

Traditional theories suggest that the brain finds acoustic cues within spoken words and automatically translates them into tiny units of sound called phonemes. The phonemes are then used in language production and perception. Consequently, interventions for language and literacy problems focus largely on improving the ability to pick up those acoustic cues in order to correctly recognize phonemes.

Nittrouer and other scientists believe that the translation of sound into phonemes isn’t necessarily automatic, and it isn’t the only thing influencing the process. Nittrouer thinks that normal hearing children with dyslexia—an unlike children with implants—can probably pick up the necessary acoustic cues, but a problem occurs in how those cues get organized.

If that is so, then intervention methods would need to be adjusted.

“If children with implants and normal hearing children with learning problems actually have broader perceptual deficits, we have to broaden our approach,” explains Nittrouer. “This means working on more than just letter sounds; it means incorporating activities that engage language perception and organization. This means more than just 20 minutes of tutoring a few times a week is needed. What’s needed is a program that involves all educators for the child’s entire day at school.”

Learn more about this research and Ohio State’s Speech Development Lab at medicalcenter.osu.edu > News & Media Room or at speechdevelopment.org.

But for Ohio State...
Nisonger Center serves citizens with disabilities

Timothy Follwell, DMD, now leads the Intellectual and Developmental Disability (IDD) Dental Program at Ohio State’s Nisonger Center, which provides a complete range of oral health services to children and adults with developmental disabilities and other special needs.

The Nisonger Center’s dental program is the largest provider of oral health services for adults with developmental disabilities in Franklin County.

“Tim will provide vision and leadership for the dental program, including the McCampbell Hall and Johnstown Road clinics, and the teaching and training of the Ohio State dental students, residents and fellows, and the dental hygiene students,” says Marc Tassé, PhD, director of the Nisonger Center.

The dental program is just one way the Nisonger Center, a University Center for Excellence in Developmental Disabilities, serves Ohioans with disabilities. For almost 50 years, the Nisonger Center has provided assistance to people with disabilities, families, service providers and organizations by promoting inclusion of people with disabilities in education, health, employment and community settings.

Recently, the Nisonger Center and the Ohio Department of Health received a $900,000 grant from the Centers for Disease Control and Prevention to work through a partnership to promote health, prevent chronic disease and increase the quality of life among people with disabilities. This partnership also involves the University of Cincinnati Center of Excellence in Developmental Disabilities. Susan M. Havercamp, PhD, director of Health Promotion and Healthcare Parity at the Nisonger Center, is principal investigator.

“The Ohio Disability and Health Program is an exciting partnership between Ohio universities and state agencies with a common outcome of improving the health and access to healthcare services for all persons with disabilities,” adds Tassé.
Wendy Pramik  |  The Ohio State University Wexner Medical Center

Maria Riza Conroy grew up in Iloilo, a mountainous province in the Philippines, where she enjoyed spending time with her wise grandfather.

"Do you see all those people?" Maria's grandfather asked. "Those are the people you need to help."

When she was 8 years old, she and her grandfather climbed a mountain overlooking their village, where farmers tilled the fertile soil. "Everybody is always thankful," says Conroy, who was recently recognized for her care to the underserved by Columbus Business First's Health Care Heroes awards program.

About ‘Journey to Innovation’

Diversity in people and ideas is a core value and strength of The Ohio State University and its Wexner Medical Center. The video series “Journey to Innovation” shares the stories of 12 foreign-born physicians who made Ohio State's Wexner Medical Center their destination.

More than 40 faculty members were nominated by their peers for the project and 12 were selected by the Medical Center's Diversity council based on their inspiring stories and contributions to medicine.

The series follows each participant's journey to Ohio State and shares his and her remarkable accomplishments at our Medical Center. Follow the 12-part series in Insight and online at youtube.com/osumedicalcenter (search “Journey to Innovation”). “Journey to Innovation” was made possible by a grant from the OSU Medical Alumni Society, Ismail Nabeel, MBBS, MPH, the OSU Wexner Medical Center Diversity Council, and the Department of Marketing and Strategic Communications.

See and hear Conroy's journey to Ohio State at go.osu.edu/Nw9.
Up Close and Personalized

Dr. Charles Lockwood is a nationally recognized leader who is preparing Ohio State’s medical students for careers in a rapidly changing healthcare environment and helping its faculty members commercialize their research discoveries. Like Dr. Lockwood, THE WORLD’S BEST AND BRIGHTEST PHYSICIANS AND RESEARCHERS ARE COMING TO OHIO STATE to create a new model for health care that is predictive, preventive, personalized and participatory. We call it P4 Medicine.

What attracted me to Ohio State? There is a commitment here not only to teach our medical students, conduct research and provide exemplary patient care, but to be innovators in each of these areas. I was also attracted to Ohio State because of the commitment of university officials and local, state and federal leaders to foster the creation of bio-tech and bio-informatics companies that will bring jobs to central Ohio and leverage the talent of our amazing faculty.

How am I advancing personalized health care at Ohio State? Ohio State’s vision for personalized health care begins in the classroom. Our College of Medicine’s new Lead.Serve.Inspire. curriculum emphasizes basic and clinical science, earlier clinical experiences and a collaborative approach to disease management and preventive care. Ohio State’s students will be better prepared to adapt to new medical technologies and changes in healthcare delivery, and more inclined to involve patients in their own care.

But for Ohio State...Ohio would not be producing some of the best trained physicians in the country. Ohio State’s reputation for excellence is drawing world-class talent to Columbus. WE HAVE ATTRACTED MORE THAN 215 EXPERTS IN 2 YEARS, AND 87 PERCENT OF CENTRAL OHIO’S BEST DOCTORS ARE OHIO STATE FACULTY. Through their skill and dedication, we are delivering on our promise to improve people’s lives, and giving central Ohioans access to the very best care.

Charles Lockwood, MD
Dean, The Ohio State University College of Medicine
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