

Teaming Up to Battle
Bone Tumors

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St. Jude Children’s Research Hospital was founded by the late entertainer Danny Thomas. It opened February 4, 1962. The institution was created because of a promise Thomas made during the depression era to St. Jude Thaddeus, the patron saint of the hopeless.

“Show me my way in life,” Thomas prayed. In return, Thomas promised to build St. Jude Thaddeus a shrine. That shrine became a world-class research institution that treats children regardless of race, color, creed or their ability to pay. This remarkable event also inspired the name of this magazine,

Promise.



St. Jude Children’s Research Hospital, Memphis, Tennessee

Promise

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St. Jude Children’s Research Hospital’s mission is to find cures for children with catastrophic diseases through research and treatment.

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On the cover: St. Jude patient José Meléndez (see article, page 18). Photo by Laura Hajar.

Highlights

Images of anthrax

Computer-generated images of an anthrax bacterium enzyme are providing a blueprint of the protein that researchers can use to design more effective antibiotics against this potential bioterrorism weapon. The images are helping to solve the mystery of how slight mutations in the shape of this protein can make it resistant to some antibiotics. The St. Jude team also developed a new molecule that may be able to block the enzyme's activity without triggering resistance; this discovery could also lead to development of antibiotics to treat a variety of other infections that are becoming drug resistant. Stephen White, DPhil, chair of Structural Biology, was senior author of a report on the findings, which appeared in the September 2004 issue of *Structure*.

Targeting croup

Croup is well-known to parents everywhere as an extremely common and occasionally serious respiratory tract infection of young children. Preliminary clinical studies conducted by St. Jude scientists evaluated an intranasal ("nose-drop") vaccine against croup in adult volunteers. The vaccine is designed to protect against human parainfluenza virus-type 1, the most common cause of the disease. No such vaccine is currently available. Findings from this study revealed that the vaccine was well-tolerated among the healthy adults. The use of nose drops would eliminate the need for infants to endure the discomfort and complications of injections. This FDA-approved Phase I trial was initiated in adults as a first step, prior to future testing in children and then infants—the ultimate target population.

Newly elected

Charles J. Sherr, MD, PhD, co-chair of St. Jude Genetics and Tumor Cell Biology and a Howard Hughes Medical

Institute Investigator, has been elected to the prestigious Institute of Medicine, a branch of the U.S. National Academies. St. Jude Director William Evans, PharmD, and former Director Arthur Nienhuis, MD, were elected to the institute in 2002. Sherr was previously elected to the National Academy of Sciences in 1995.

Regulating genes

St. Jude researchers have discovered a cellular mechanism that explains how cells are able to rapidly meet the need for increased production of specific proteins by coordinating the tasks of folding and packaging them. This discovery was made by Suzanne Jackowski, PhD, of St. Jude Infectious Diseases, along with colleagues at Loyola University and Kyoto University. The finding is published in the October 2004 issue of *Journal of Cell Biology*.

Radiation begone

A clinical trial conducted by St. Jude investigators offers hope that physicians might one day be able to omit radiation as part of routine treatment for acute lymphoblastic leukemia (ALL). The researchers' conclusions were reported in the November 2004 *Blood*. St. Jude physicians used a system of improved risk classification, a drug called dexamethasone and more intensive

chemotherapy to treat high-risk patients with ALL. A combination of three drugs was injected into the fluid-filled space between the membranes covering the spinal cord. Patients at high risk received more injections during the early phase



Prince Albert of Monaco visited St. Jude in October at the invitation of Richard Shadyac, ALSAC chief executive officer. The prince has co-hosted two St. Jude fund-raisers in his country and was interested in seeing the hospital firsthand. During his tour, he visited with patients, such as Andrew Benson (pictured above), and heard presentations by William Evans, PharmD, hospital director; John Cunningham, MD, of Hematology-Oncology; Tom Curran, PhD, of Developmental Neurobiology; Mary Relling, PharmD, of Pharmaceutical Sciences; and Elaine Tuomanen, MD, of Infectious Diseases.

LAURA HARR

of therapy. This approach has greatly reduced the rate of central nervous system relapses. Ching-Hon Pui, MD, director of the St. Jude Leukemia/Lymphoma Division, was the first author of the *Blood* article.

Putting on the brakes

St. Jude researchers showed that the *Lag-3* gene is key to preventing an activated immune system response from running out of control. Dario Vignali, PhD, of St. Jude Immunology collaborated with scientists from The Johns Hopkins Kimmel Cancer Center on the study, which was reported in the October issue of the journal *Immunity*. The finding could form the basis for new strategies for improving the efficacy of anti-cancer vaccines or preventing autoimmune diseases.

Tops in the "50"

Richard Webby, PhD, of St. Jude Infectious Diseases was named one of the *Scientific American* 50 for 2004—an annual list of researchers recognized by the magazine for outstanding acts of leadership in science and technology. Webby was noted for his work using reverse genetics—a technique for custom-making influenza strains in as little as 14 days.

Targeting proteins

A unique tail at one end of a protein called Ubc12 stabilizes a molecular workshop that assembles the "on-switch" cells used to accelerate cell replication. The discovery of the exact structure of the tail and its role in cell replication holds promise that researchers can develop new types of drugs targeting the tail or the workshop itself, turning off the unrestrained multiplication of cancer cells. Brenda Schulman, PhD, of Genetics and Tumor Cell Biology and Structural Biology, is senior author of a report on this finding that appeared in the October 2004 issue of *Nature Structural and Molecular Biology*.

Disruptive fat molecule

St. Jude scientists have found that excess accumulation in brain cells of a fat molecule called GM1-ganglioside (GM1) disrupts the folding of newly

assembled proteins into their proper shapes. This disruption triggers nerve degeneration and mental retardation in children. The discovery offers strong evidence for the cause of a genetic disease called GM1 gangliosidosis. Alessandra d'Azzo, PhD, of Genetics and Tumor Cell Biology is senior author of a report on the findings, which appeared in the September 2004 issue of *Molecular Cell*. The paper was also featured in an editorial published in the November issue of *The Lancet Neurology*.

Tests on the way

Peter Houghton, PhD, chair of Molecular Pharmacology, is principal investigator for the Pediatric Preclinical Testing Program recently established by the National Cancer Institute. The program is expected to test 10-15 new anti-cancer drugs per year.

Tricky lesions

Therapy commonly used to treat two types of brain tumors can cause changes in the brain that look like tumors when seen on MRI scans. The irradiation and high-dose chemotherapy used to treat medulloblastoma and supratentorial PNETs can cause changes in the part of

the brain called white matter. The damage, called white matter lesions, can be mistaken for recurrent cancer, prompting physicians to treat the patient aggressively—and needlessly—with more radiation and chemotherapy. Amar Gajjar, MD, director of Neuro-Oncology at St. Jude, was senior author of an article on the topic that was published in the November 2004 issue of *Journal of Clinical Oncology*. The study is the first to describe both the finding and how frequently these lesions occur. The St. Jude researchers were also the first to note the impact of such changes on intellectual outcome in children with brain tumors.

Bound for Scotland

Brian Sorrentino, MD, director of the St. Jude Experimental Hematology division, has won a prestigious award from the International Society of Experimental Hematology (ISEH). The 2005 ISEH McCulloch and Till Lectureship and Award will be presented to Sorrentino during the ISEH annual scientific meeting in Glasgow, Scotland, in July of 2005.

For more detailed news about St. Jude research, visit the hospital's Web site at www.stjude.org/media.



Pooches from across the nation came to Memphis in October to show off in grand style at the ninth annual St. Jude Showcase of Dogs. The three-day event is the only one of its kind in North America and is designed to celebrate dogs and raise money for St. Jude. Since its inception, the show has welcomed about 270,000 attendees from across the United States, and has raised more than \$230,000 for the hospital.

SETH DIXON

A Promise Kept

The **Swords** are relying on **St. Jude** to **help** their boys beat a **disease** that has haunted their **family** for generations.

BY TANUJA COLETTA

Ryan Sword will be an old man some day. His mother told him so.

The seventh-grader brushes the hair out of his brown eyes and beams confidently, pondering his future. He thinks he'll have a wife and kids someday, but for now, he's content spending afternoons racing his four-wheeler with his uncle.

At 14, Ryan is sure about one thing—he won't be beaten by the disease that has haunted his family for generations. His mother, Anna Marie, succumbed to colon cancer at age 30. The disease now threatens Ryan and his 3-year-old brother, Nick.

"I'm not scared," Ryan says. "My mom's in heaven, and she told me that I'm going to grow up and live a long time. She made a garden up there with tomatoes and flowers, and she wants me to help her tend to it. But she said that it would be a while; it's not my time yet. I'll be an old man before I go."

Ryan's grandparents, Larry and Shirley Sword, pray that Ryan is right. In the final days of their daughter's life, they vowed to raise her boys to be healthy and happy. With the help of St. Jude Children's Research Hospital, it's a promise they intend to keep.

Sucker-punched

When Anna Marie passed away, it was all Larry Sword could do not to break down.

His gruff exterior masks the soul of a teddy bear. "She was my princess," he says, running his fingers through his salt-and-pepper beard. "You can't know what it's like to lose a child until it happens to you. It's like someone sucker-punched me in the gut."

Larry draws strength from his grandsons. "I guess God just thought we had a lot more love to give," he says. "I was left here for a reason."

Larry is battling colon cancer himself. During the past several years, he learned that his family has had a long history with the disease. Larry found out in time to have his colon removed; a more rapid form of the cancer didn't give his daughter the same chance.

The first sign that the disease had passed onto the next generation came when Ryan was 16 months old. However, instead of colon cancer, tests exposed a liver problem.

"When Ryan was a baby, he cried all the time, and his stomach was pooched out like he was bloated," Shirley remembers. An ultrasound revealed a five-pound tumor on Ryan's liver. Ryan had hepatoblastoma, a cancer that affects 1 in every 100,000 children per year. The disease usually shows up in children under age 3.

"I just prayed and put him in the Lord's hands," Shirley says. The family was immediately referred to St. Jude.

Fourteen-year-old Ryan and his little brother, Nick, both had hepatoblastoma, or liver cancer. They are now threatened by the specter of colon cancer, which took their mom's life in 2003.

PHOTOS BY ANN-MARGARET HEDGES





Because his grandfather and mother had colon cancer, St. Jude physicians tested Ryan and found that he had inherited a disorder that leads to that cancer.

Jumping hurdles

Ryan was enrolled on a special hepatoblastoma treatment plan that St. Jude doctors helped pioneer. Four rounds of chemotherapy shrank Ryan's tumor, and surgeons removed the remaining mass and half his liver. After two final rounds of medicine, Ryan was cured.

Several years later, Nick was brought to St. Jude with the same disease. He was treated on a protocol similar to his brother's, and St. Jude doctors were able to cure Nick, too.

Nick's doctor, Wayne Furman, MD, hopes to bring the same results to children with more aggressive forms of the disease. "Nick is doing great, and we want to find medications that will similarly cure all children with this disease," he says.

Furman is deputy director of the St. Jude Solid Tumor Clinic and is a member of the Children's Oncology Group's Liver Tumor Committee. The group plans to open a new study next year in which hospitals around the country will send tumor samples from children with hepatoblastoma to St. Jude. Researchers will grow the samples in laboratory models and treat them with new drugs. "If the

results are promising, we can eventually take those medications and try them in actual patients," Furman says.

For Ryan, liver cancer was the first hurdle. His next challenge was one his family has tried to overcome for more than a century.

Beating the odds

Ryan had a colonoscopy after his mother's colon cancer was diagnosed. The test showed he had 18 polyps growing in his colon. Ryan's condition is familial adenomatous polyposis (FAP), an inherited disorder linked to colon cancer. Without treatment, the polyps almost always become cancerous.

Because his St. Jude doctors caught the disease early, Ryan was able to undergo surgery to remove part of his colon. His prognosis is good, says Stuart Kaplan, MD, who has monitored Ryan's progress since he completed therapy. "He should be able to grow up and lead a happy, normal life," Kaplan says.

In addition to colon cancer, children with FAP also have higher odds of developing hepatoblastoma as Ryan and Nick did. Although Nick appears to be cured of his hepatoblastoma, because he has FAP, he will most likely develop colon cancer when he reaches his 20s unless part of his colon is removed. Thanks to early detection, Nick can have a procedure similar to his brother's to avoid developing colon cancer.

"Understanding how genetic disorders like FAP are passed down from parent to child is an important step in beating such diseases," says Patricia Gordon, MD, St. Jude clinical geneticist. Since Ryan and Nick are carriers of the mutated gene that causes FAP, they could

Nick's future looks bright, since physicians will be watching him closely and taking early action if colon polyps develop.

pass the gene to future generations. "The positive aspect of their story is that we can now take preventive measures with each younger generation," Gordon says.

It's a lesson for all families who see patterns of disease among their relatives, she explains.

"It's sometimes difficult for families to talk to each other about cancer, but recording your family medical history—finding out the specific diagnoses and ages that people were affected—can be very helpful to future generations," she says.

Sweet dreams

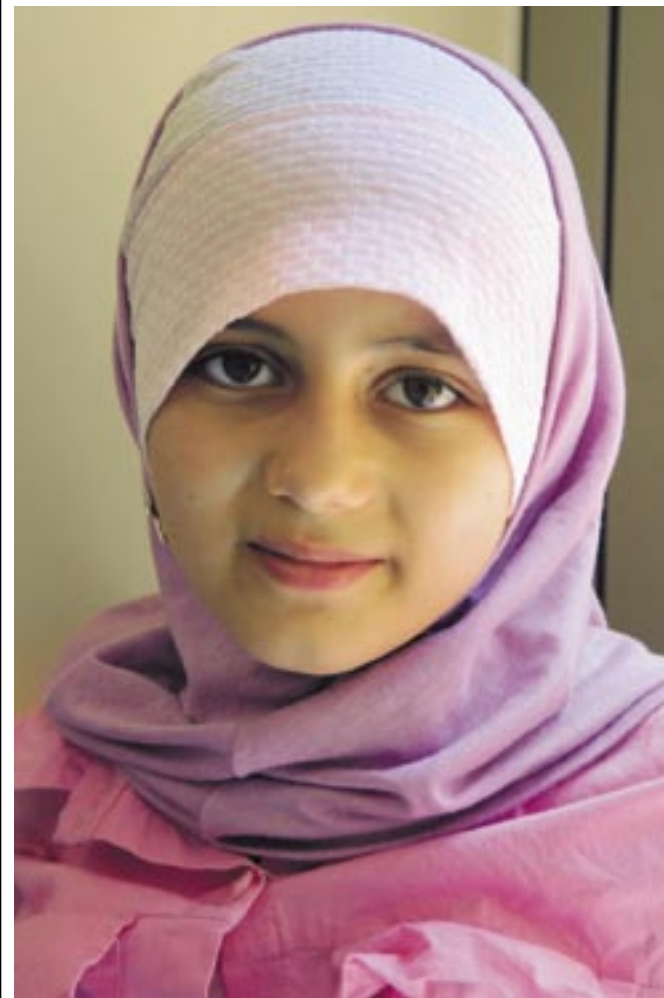
When a charity gave Ryan the chance to have a wish fulfilled, he dreamed big. "I asked them to bring my mom back," he said. "She was a great mom. But it wasn't possible."

Instead, Ryan waits for his mother to visit him in his sleep to tell him jokes and remind him to look after his brother, a ball of energy.

Larry is certain his daughter would be happy with how her boys are growing.

"Her kids always came first, so I think she can rest easy knowing that St. Jude saved her boys," Larry says.

"That was the promise we made, and all I can hope for is that they grow up strong and happy."●



**A St. Jude-affiliated
cancer center brings hope
to the
children of Lebanon.**

BY TANUJA COLETTA



Danny Thomas went “home” for the first time in 1962. The year he opened the doors to St. Jude Children’s Research Hospital, Thomas also traveled to Lebanon, the land of his ancestors. He and his wife, Rose Marie, drove through the mountains, across valleys where ancient cedar groves once reigned supreme. Tears welled in Thomas’ eyes; his pride beat like a drum inside his chest. This was the land of his heritage, the land that birthed his love of family and respect for hard work. He deeply desired to give something back.

Perhaps it was during this trip that Thomas’ yearning gently dropped from his heart like a seed to the soil. Four decades later—in the time it takes the mighty Cedar of Lebanon to mature—the land has given rise to a “mini St. Jude.” This facility shines as a ray of hope reaching across the Middle East to thousands of children and their families.

Spreading knowledge

The Children’s Cancer Center of Lebanon (CCCL) is one of 18 St. Jude affiliates around the world. Perched on the eastern banks of the Mediterranean Sea on the campus of the American University of Beirut (AUB), the center is the product of collaboration among St. Jude, AUB and the CCCL Foundation.

Before the center opened in 2002, many Lebanese children with leukemia were either flown to St. Jude for treatment or received therapy that was often not tailored for young patients.

“They were getting decent care, but it was too fragmented,” says Bassem Razzouk, MD, director of Middle East Programs for St. Jude International Outreach. “What we want to do with this center is show that if you treat children with cancer the way we do at St. Jude—with a centralized, multi-disciplinary approach in a good cancer unit—you can cure them. You can save their lives.”



Patients and their families across the region are turning to the St. Jude affiliate, Children’s Cancer Center of Lebanon, for treatment and hope. The CCCL Foundation raises funds for the center, just as ALSAC does for St. Jude; therefore, patients are never turned away because of an inability to pay.

The CCCL program is mirrored after St. Jude treatment guidelines, says Miguel Abboud, MD, CCCL medical director. The center treats most of its 65 new patients each year on an outpatient basis and hospitalizes them only in critical cases. The CCCL Foundation raises funds for the center just as ALSAC does for St. Jude so that patients are never turned away because of an inability to pay.

The 20,000-square-foot center features state-of-the-art technology in its examination and recovery rooms, treatment areas, pharmacy and laboratories.

Even the children’s play area is equipped with computers. Abboud spent two decades practicing medicine in America, and St. Jude trained most of the center’s employees through fellowships at St. Jude and resources available on the St. Jude *Cure4Kids* Web site.

“Thanks to St. Jude, we are now able to give the best possible care with the best resources to the children of Lebanon,” Abboud says. “This sharing of advanced science and caring for people is the shining face of America. It is what St. Jude is all about.”

This cancer center is one of 18 St. Jude affiliates around the world.

Committed to the idea of freely sharing knowledge throughout the world, St. Jude has even trained oncologists at CCCL’s peer institutions throughout Lebanon.

“We want this center to serve as a model for cancer care, not a competition,” says Razzouk. “That is why we offer training, diagnostic services and second opinions free to physicians throughout the area who are treating pediatric cancer patients. This way, no child is left out of the loop.”

Branching out

At a fund-raising event last summer, 12-year-old patient Charbel Khalil read a letter he had written to thank his CCCL caregivers. “How can I repay your kindness?” he asked. “All the ink in the world would not be enough.”

Hundreds of children from Lebanon and the surrounding region share Khalil’s feelings. Patients fill the CCCL halls with laughter as they embrace nurses and chase volunteers through the colorful corridors. Raya Saab, MD, was awestruck by the

sheer joy. An AUB graduate and St. Jude pediatric Hematology-Oncology fellow, Saab went back to her homeland to work at the CCCL for several months.

“I remember when I was in medical school taking care of young patients and wondering if they would have had better outcomes if we just had the right resources,” she recalls.

Now, things are different. “It’s amazing,” Saab says. “This is one of the best things that has happened to the children of Lebanon in a long, long time.”

Richard Shadyac wishes his good friend Danny Thomas could see the center. “Danny and I used to talk about taking the treatments at St. Jude to Lebanon, but because of the civil war over there and the embargo, we had to wait,” he says. The trade embargo was lifted after Thomas’ death, and Shadyac, chief executive officer of ALSAC, decided to fulfill their shared dream. The support has been tremendous.

“Everyone wants to be part of this because they believe in the St. Jude mission,” he says.

Shadyac says AUB was the ideal partner because of the university’s tradition of research and teaching, and because it holds no religious or political affiliation.

“This place is like a mini St. Jude,” he says. “Think of what we can accomplish if we all work for a common goal. This hospital has united people in every realm throughout the country, all because of a common goal—saving the lives of children. What an empowering legacy.”

Seeds for the future

Although the CCCL is still in its infancy, Abboud can envision the center outgrowing its sapling state and becoming a bastion of strength for medical centers throughout Lebanon and neighboring countries.

“I hope to get to the point where we are not only providing the highest level of patient care, but also contributing knowledge that will be useful in creating St. Jude protocols that can be used all around the world,” he says. The CCCL has begun working on clinical research projects with St. Jude and plans to do follow-up research with patients after they complete therapy. Abboud also looks forward to eventually accepting patients with sickle cell disease and other catastrophic illnesses.

The CCCL is already continuing the spirit of sharing. Lebanese surgeons trained at St. Jude to perform limb-saving surgeries are teaching the procedure to doctors in Jordan.

“We want to foster that kind of regional collaboration,” says Razzouk. “If we share knowledge, we don’t have to reinvent the wheel in each country.”

Instead, Razzouk sees the Children’s Cancer Center of Lebanon as the premier pediatric cancer center for the entire Middle East. “Like St. Jude, it will be a crown jewel for childhood cancer care for that region,” he says. “It’s a dream come true to share our advances and see how St. Jude is truly a hospital without walls.”●



Collaboration—like this meeting of medical staff from St. Jude and CCCL—occurs on a regular basis. The CCCL is working on clinical research projects with St. Jude and plans to do follow-up research with patients after they complete therapy. Lebanese surgeons trained at St. Jude to perform limb-saving surgeries are teaching the procedure to doctors in Jordan.

Three Cheers for PROGRESS

Researchers at St. Jude have identified in the lab what may be the first non-toxic treatment for the brain tumor medulloblastoma.

Last year, Adovia Alston was a straight-A student who served on the student council, the cheer squad, the bowling league and the dance team. Then she discovered that she had medulloblastoma, the most common malignant brain tumor in children. Medulloblastoma affects the cerebellum, the part of the brain that controls movement and coordination. To get rid of the cancer, Adovia had to endure a grueling regimen of surgeries, chemotherapy and radiation treatments. Today, the 10-year-old from Michigan has already resumed most of her activities and is again winning awards for academic excellence.

BY ELIZABETH JANE WALKER

Adovia's miraculous recovery is not the norm. The overall five-year survival rate for this cancer is about 70 percent. But the radiation and chemotherapy needed to kill the tumors often cause severe problems with balance, growth, intellect and behavior.

That's why a recent discovery at St. Jude Children's Research Hospital has elicited intense interest from the medical community. In the laboratory, St. Jude researchers proved that by blocking a single protein, they can kill medulloblastoma cells without chemotherapy or radiation treatments.

Thanks to a new discovery by scientists in St. Jude Developmental Neurobiology, children like Adovia Alston may someday be able to conquer medulloblastoma without radiation therapy or chemotherapy.

ANN-MARGARET HEDGES



SETH DIXON

Justyna Romer, PhD, and Tom Curran, PhD, led a team that found a new way to fight medulloblastoma. By inhibiting the Sonic Hedgehog pathway, they were able to destroy tumors.

Collaborating for cures

Scientists in Developmental Neurobiology at St. Jude study how the brain develops to better understand what goes wrong when tumors form. These researchers collaborate with physicians to make discoveries that can be turned into treatments. This teamwork ultimately benefits the kids.

"In our brain tumor program, members of the clinical staff who are treating patients work closely with people in the labs who are doing the basic research," says Amar Gajjar, MD, director of Neuro-Oncology at St. Jude. "This kind of collaboration is very rare in the academic world."

Nine years ago, Tom Curran, PhD, came to St. Jude to build this bridge and foster new approaches to the treatment of brain tumors.

"Basically, we had reached the point where existing therapies were as good as they were going to get, so we were not going to make any significant improvement without a totally new approach," says Curran, chair of Developmental Neurobiology. "The way to do that is to understand the biology from a fundamental level. Together, we can do things that neither group would be capable of doing alone."

Curran's recent study exemplified exactly what the St. Jude teams set out to do: to take an idea from a basic research lab that studies brain development and apply it to the treatment of pediatric brain tumors.

A long shot

Two years ago, Curran met with postdoctoral fellow Justyna Romer, PhD, to gauge her interest in developing a way to test a new drug. The work would be tedious and time consuming, warned Curran. He could not guarantee that the project would be successful. "Most people didn't want to do it because they didn't think it was going to work," Curran recalls.

"It was basically a shot in the dark," adds Romer. "I'd just have to do a lot of work and see what happened."

Romer accepted the challenge and began working on the project. It involved a compound called HhAntag. This drug inhibits what is called the Sonic Hedgehog pathway.

After it is made by a brain cell, the Sonic Hedgehog protein binds to the receptor on another cell, telling that cell to divide. As a fetus develops, the growth and size of the cerebellum depend on Sonic Hedgehog's ability to tell other cells to divide. Sometimes a communication link is broken, and the signal continues to be passed forward when it should not be. When that happens, the cell continues to divide with

abandon, causing a medulloblastoma tumor.

Romer found that HhAntag short-circuited that process. It suppressed several genes expressed in medulloblastoma. To the researchers' delight, the HhAntag compound blocked cancer cell growth, causing tumor cell death. At the highest dose, the treatment completely destroyed the tumors. Because the drug worked only on the Sonic Hedgehog pathway, no side effects were seen during the course of treatment.

Curran says the discovery amazed some of his colleagues in the scientific community. "It is totally surprising that you can, with one drug, wipe out a solid tumor mass," he says. "Probably most people in the oncology field would not have predicted that you could do that. Will it work in humans? I don't know yet."

Romer and Curran say the drug might also have some effect on other diseases, including prostate, skin, lung and gastrointestinal cancers.

Future research

Although the discovery is exciting, St. Jude researchers know that much work is left to do before the drug can be tested on children. Clinical trials with the drug may be several years away. Even so, the finding shows the world that St. Jude is on the front line of molecular-targeted cancer research.

Adovia Alston's mom is amazed by the thought that patients with medulloblastoma might someday receive a much gentler cancer treatment than is possible now.

"Are you kidding me?" she asks, when told about the new discovery. "No chemo and no radiation? Adovia had three surgeries, 31 radiation treatments and four rounds of high-dose chemotherapy. Treatment without that would be really wonderful."

For more details about this research, visit the St. Jude Web site at www.stjude.org/curran. ●

Brave New Cells

BY ELIZABETH JANE WALKER

With the discovery of another blood stem cell that gives rise to bone, St. Jude scientists hope to move one step closer to a cure for osteogenesis imperfecta.

When a baby is born, the delivery room invariably echoes with the bright peals of baby cries, the oohs and aahs of admiring nurses and the excited comments of proud parents. But when Molly Hammond was born in May of 1996, the obstetrician was taken aback by a horrific sound—the sickening crack of breaking bones. X-rays showed that Molly had incurred many fractures during birth, including ones in her legs, arms and collarbone.

The next day Scott and Patty Hammond learned that their beautiful baby daughter had osteogenesis imperfecta (OI), a rare genetic disorder also known as brittle bone disease. OI affects the production of collagen, the protein that provides the frame-

work, or “scaffolding,” for bone and other connective tissues. In addition to frequent broken bones, the disorder leads to excessive fragility, short stature, deformities, and in its severe form, death.

“The doctor told us that they didn’t know of a cure for OI,” Patty recalls. “They basically told us to take Molly home and love her.”

A year-and-a-half later, Patty’s husband, Scott, read an article about Edwin Horwitz, MD, PhD, of St. Jude Children’s Research Hospital performing the world’s first bone marrow transplant for osteogenesis imperfecta. When the “sick” bone marrow was replaced with donor marrow, the child’s body began to produce new, healthy cells. Molly’s parents contacted Horwitz,

and he brought Molly to Memphis for evaluation. “I immediately loved St. Jude,” Patty recalls. “I got this overwhelming feeling the first time I walked through the door. I don’t know how to explain it. I just felt that this was something we were meant to do, and that St. Jude was going to do great things.”

Molly received a transplant from her oldest sister, Marissa, in August of 1998.

Bone booster

For the past 10 years, Horwitz has led teams of St. Jude researchers and clinicians in trying to understand the biology of stem cells. They have used that information to develop new therapies for children with OI. In the hospital’s first clinical trial for osteogenesis imperfecta, physicians transplanted whole bone marrow. They discovered that donor cells would engraft and actually help the bone grow more normally. But as time passed, the growth slowed and benefits from the transplant decreased. In a second study, patients received infusions of mesenchymal stem cells. These primitive bone marrow cells can renew themselves and mature into bone or connective tissue. Again, however, the benefits were fleeting.

Horwitz turned to the laboratory searching for ways to get better engraftment and to improve the outcome for children. Using a technique called retroviral integration site analysis, St. Jude postdoctoral fellow Massimo Dominici, MD, used a gene marker to pinpoint the type of bone marrow cell that could mature into bone-producing cells. Horwitz, Dominici and other team members found strong evidence that a specific type of stem cell gives rise to both bone and blood cells. This kind of cell seems to engraft in bone even better than mesenchymal cells do. “For the first time, we’ve shown that a cell that gives rise to blood also gives rise to bone, and that the source of some of the bone-making cells in the body comes from the same cell as the blood,” Horwitz says. Results of this study were published in the August 2004 edition of *Proceedings of the National Academy of Sciences*.

Horwitz says the principles identified in this research may also be applied to many other diseases in bone and other tissues. The primitive cell might one day be the basis for new medical treatments to repair bones that have been damaged by disease or trauma. “Many times we take models that were developed for one system, apply that same strategy to another system, and it turns out to be very effective,” he says. “I think this will be one of those cases where there’s a certain paradigm we’re defining between bone marrow and bone that can be used for other tissues, as well.”

Because Horwitz and his colleagues had proven that both the newly identified cell and the mesenchymal cell can create bone, St. Jude opened a third clinical trial in the summer of 2004. Patients like Molly, who received stem cells in the past, have been offered the chance to undergo new transplants using whole bone marrow, which contains both kinds of beneficial cells. Patients in this study are using the same donors as in previous transplants, so the risk of graft rejection is slim. Before it is given to OI patients, the donated marrow is processed to remove

T cells that could cause graft-versus-host disease. Researchers are now evaluating Molly and other patients who have undergone this latest procedure to see whether they are receiving benefits from the new bone marrow.

Forcing the issue

“To find a cure for OI, you’re going to need to find a cell that can continually make bone, get it inside the bone, and then find a way to make it happen,” Horwitz says. The next step is to find a way to force certain cells to go into bone.

“Now, how can we make it happen at will?” he muses. “That’s what we’re exploring in the laboratory right now. Can we perhaps give a cytokine or a hormone or something that will force the cell to become bone?” If his hypotheses work out, Horwitz says a clinical trial involving children could begin less than five years from now.

While research progresses in the lab, Horwitz hopes to help current patients continue to improve by giving them repeated infusions of mesenchymal cells. The St. Jude researchers proved the process safe in past trials. “We know that mesenchymal cells do help, and there’s a lot to be learned from repeated infusions with them,” he says. “If it works, that’s marvelous. If it doesn’t work, it won’t hurt the kids. There’s no way to know except to do it, and we have to try.”

One step at a time

Molly Hammond is doing well since her latest bone marrow transplant. She has come a long way, says Patty, who remembers carrying Molly around on a pillow when she was an infant. “When Molly was born, we were afraid to touch her because we didn’t want to hurt her,” Patty explains.

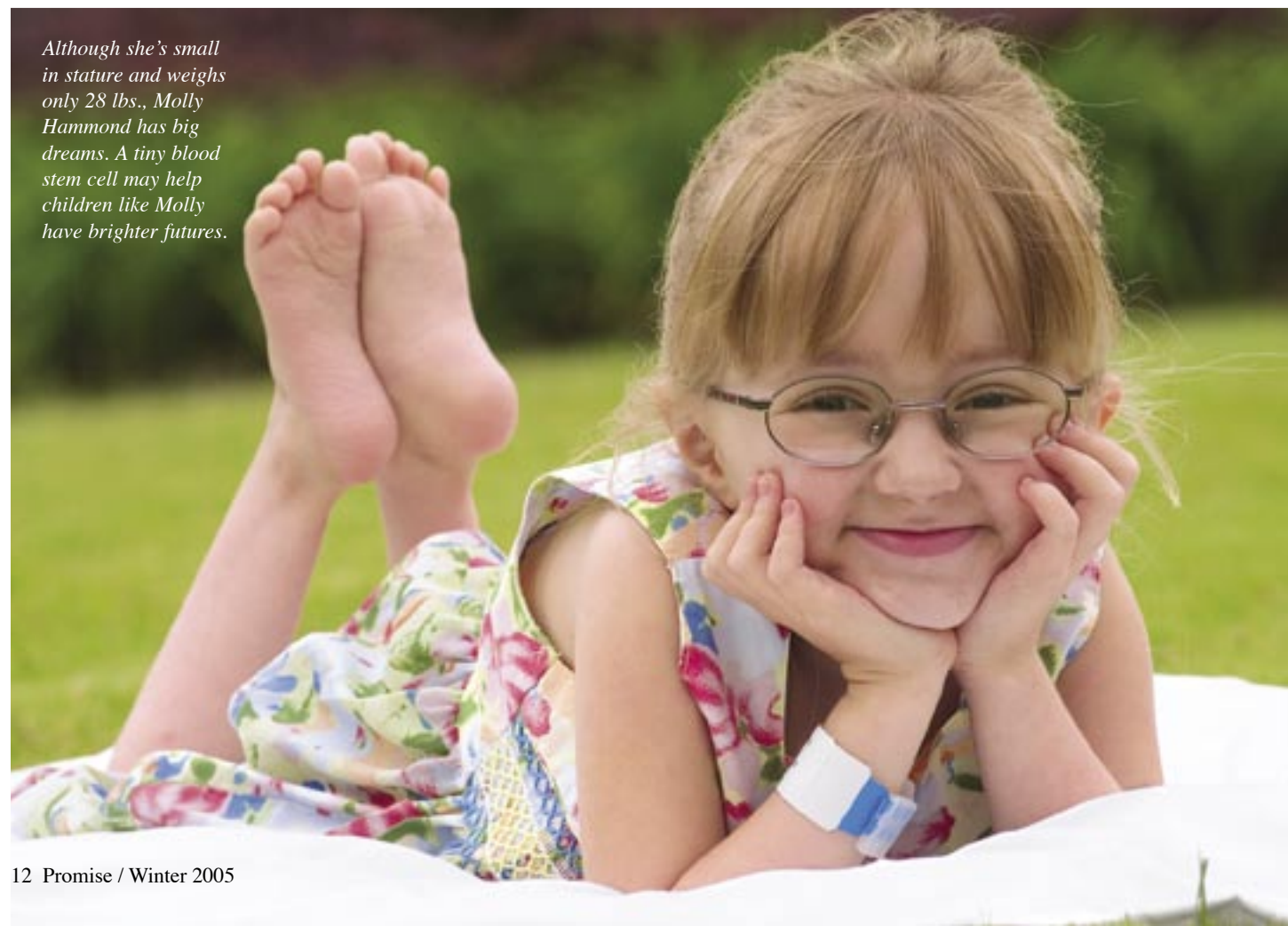
Although still diminutive—she weighs only 28 pounds—the bubbly, intelligent third-grader attends a Vermont public school and constantly attracts new friends with her happy demeanor and keen sense of humor. In addition to playing chess, video games and board games, Molly spends her free time doing arts and crafts and is looking forward to taking piano lessons in the near future. “She’s quite independent,” says her mother. “She’s just like any other kid in school, only she uses a wheelchair.”

The transplants at St. Jude have helped Molly tremendously. “Her fracture rates have decreased, and she’s grown,” Patty observes. “I think it’s everything that St. Jude has done with this treatment that has made her who she is today.”

Like other parents of children with osteogenesis imperfecta, Patty and Scott are anxious for new scientific discoveries that will change the course of Molly’s future. “We have hopes that Molly will walk one day,” Patty says. In the labs and clinics at St. Jude, Horwitz and his colleagues work diligently trying to reach that goal, as they move toward a cure, one step at a time. ●



Edwin Horwitz, MD, PhD



Although she’s small in stature and weighs only 28 lbs., Molly Hammond has big dreams. A tiny blood stem cell may help children like Molly have brighter futures.

PHOTOS BY ANN-MARGARET HEDGES

On with the Show

BY JOE HANNA

In the early days, Danny Thomas mounted the stage to help them raise funds. Today, the Southern Virginia Hampton Roads chapter of ALSAC uses other ways to raise more than \$2 million a year for St. Jude.

Peter Decker welcomes Danny Thomas to Norfolk, Virginia, on the entertainer's first trip to the city.

Some 40 years ago—just after St. Jude Children's Research Hospital opened its doors to the world—Norfolk, Virginia, attorney Peter Decker was asked by ALSAC employee Jerry Farrar to head a fund-raising chapter in the Tidewater area.

"I had a bustling law practice," Decker recalls. "I was too busy, I thought."

But by the time St. Jude Board members Richard Shadyac and Ed Soma, MD, talked to Decker, the charismatic attorney knew he would do it.

"I don't know anyone who can say no to Shadyac," Decker recalls. "And Soma ain't no slouch either," he adds, in what friends and colleagues know as the Peter Decker style.

Decker, who enjoys singing as well as practicing law, recruited his friends Bill Abourjillie, Pacific Romeo and Pat Versprille to help.

One of Decker's favorite memories is of an event called "An Evening with Pete," an entertainment dinner where Decker would perform. "I never asked Danny [Thomas] to come down here because everybody else was always pulling him by the hand and trying to get him in front of them," he says. But Decker

always sent a tape of the show to Thomas. "Danny would call me and tell me how much he enjoyed the tape. So after about four or five years, Danny called me and said, 'Peter, why won't you let me be on your show?'"

"Think about that," Decker exclaims. "Danny Thomas wants to be on *my* show." Decker changed the name of that year's event to "An Evening with Danny." Thomas went on to appear on Decker's show three more times.

Years later, the Southern Virginia Hampton Roads chapter of ALSAC is still a strong force in the Norfolk area, raising more than \$2 million each year for St. Jude.

The group of four who organized everything from canister drives to Teen Marches has grown to more than 30 committee members who coordinate gala dinners and the chapter's St. Jude Dream Home.

Chapter president Howard Webb says he has been thrilled to be part of the chapter.

"For me, being president has been a tremendous honor," he says. "Everyone on the board is a team player. They are really dedicated to saving lives."

Abourjillie credits the success of the chapter to Decker. "He is the force behind the whole thing. Without him, I hate to say it, there would not be a chapter."

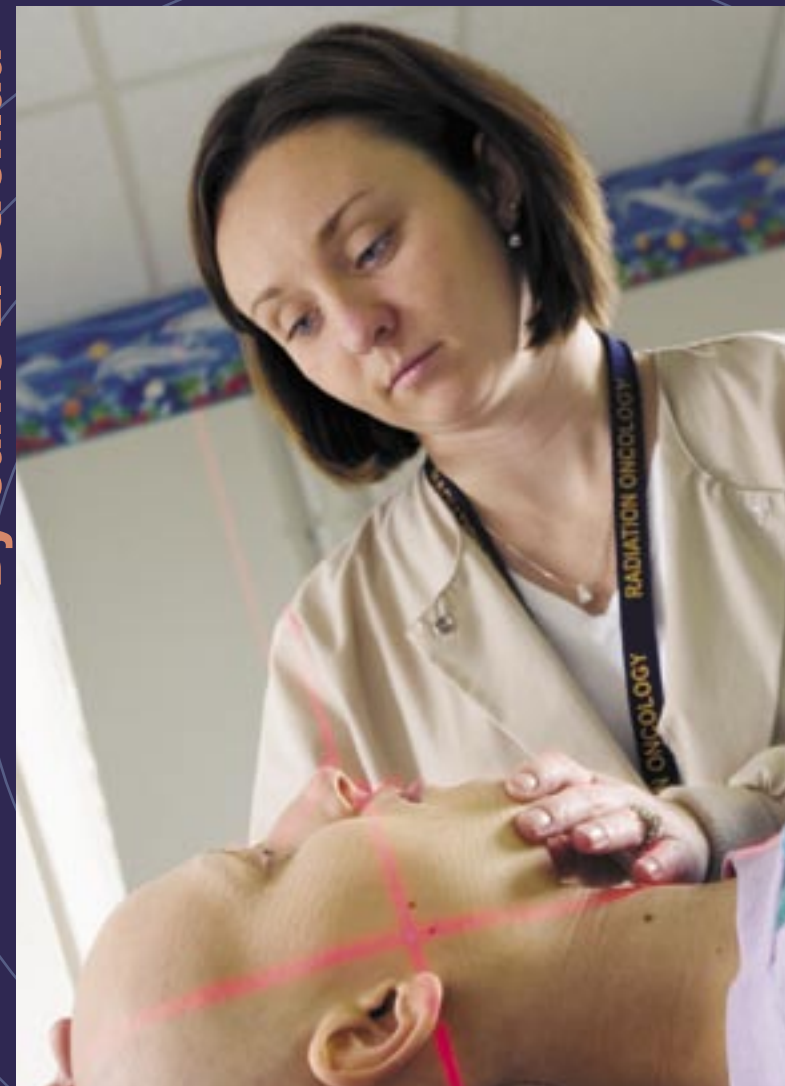
Decker, however, is quick to deflect accolades to Webb and others in the chapter. Webb, in turn, passes those accolades on to others. "It is amazing how much you can accomplish when you give other people credit," Webb says. "They made me look good."

"It's amazing how much the chapter's grown," Abourjillie says. "I can't tell you how much we did the first couple of years but it wasn't very much." But as the Southern Virginia Hampton Roads chapter has grown and spread the word of St. Jude in the area, they have brought more and more people into the St. Jude family.

"So many people across the country have joined in the St. Jude cause to find a cure for these deadly diseases that strike children, and that is one of the reasons the hospital has been able to push cure rates higher," says David McKee, chief operating officer for ALSAC. "The Southern Virginia Hampton Roads chapter and those in the region that have supported their efforts have been instrumental in supporting the research at St. Jude." ●

Spotlight on Conformal Radiation

By Carrie L. Strehlau



SETH DIXON

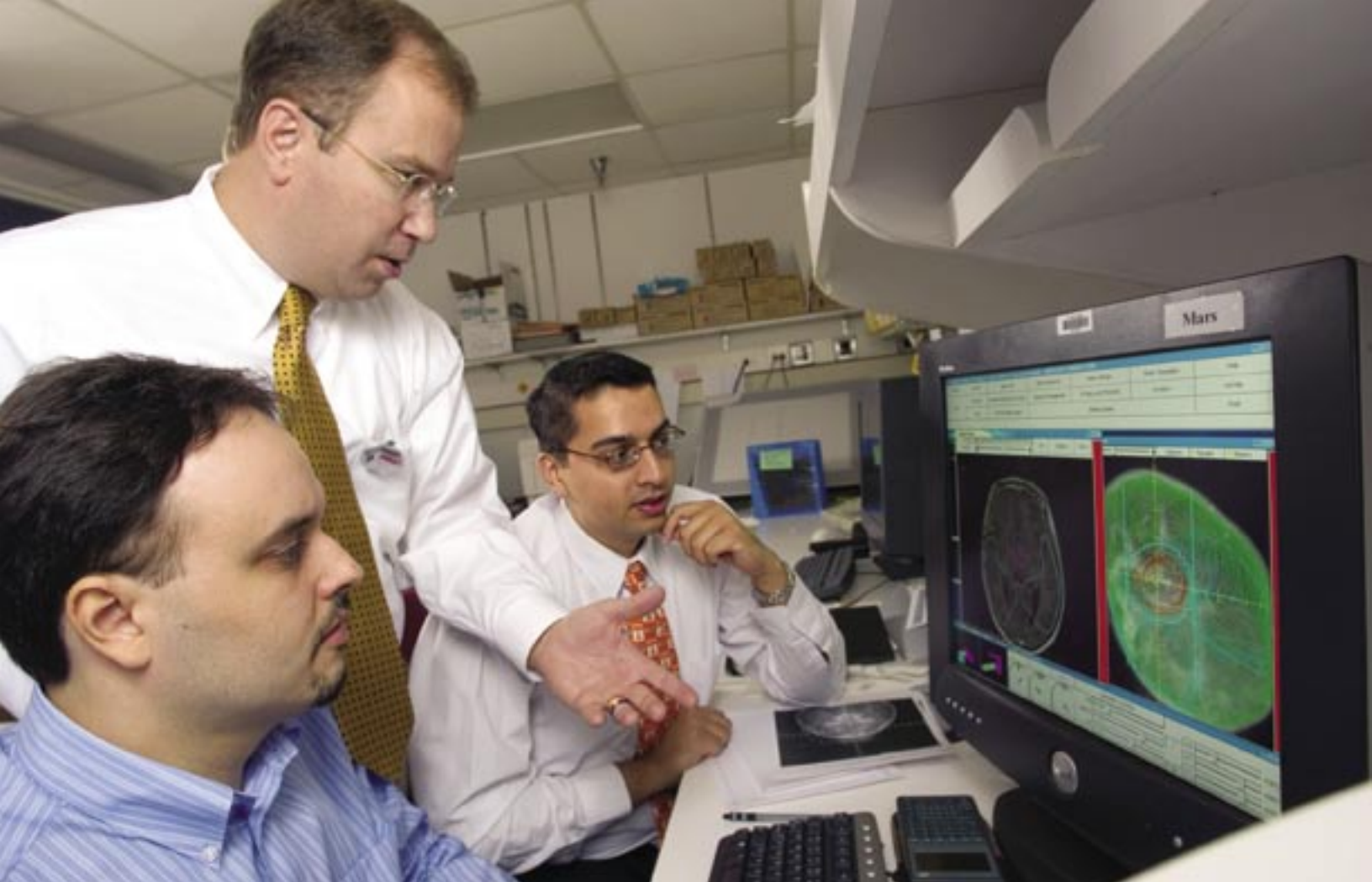
Patient Kendra Wheeler, 18, was diagnosed with Ewing's sarcoma in June 2004 and is undergoing treatment through a combination of chemotherapy and radiation therapy. She says she feels relaxed before her radiation therapies in part because of an attentive staff that includes Christy Hobson, RT(T). "They usually play pop music in there," says Wheeler, who traveled to St. Jude from Missouri. "I will listen to anything that doesn't put me to sleep."

Encouraging results of a St. Jude conformal radiation trial hold promise for young children with brain tumors.

It's premiere night. The red carpet is out, and the star of the show—radiation therapy—is making its comeback performance.

Often thought to be a character with a dark side, radiation therapy has been revived in a new and improved form. Conformal radiation therapy is now taking center stage. In a

recent study at St. Jude Children's Research Hospital, conformal radiation received rave reviews. When used on children with ependymoma—a malignant brain tumor—this treatment allowed patients to have normal development of memory, reasoning, problem-solving and other cognitive functions.



Thomas Merchant, DO, PhD, chief of Radiation Oncology at St. Jude, is one of the world's pioneers in the use of conformal radiation in children. This therapy obliterates brain tumors while sparing surrounding healthy tissues. Here, Merchant consults on brain scans with Marcelo Cassese (at left), a medical physicist in Radiation Oncology, and Mohammad Khan, a medical student from the University of Tennessee, Memphis.

In the spotlight

What makes conformal radiation so revolutionary? This precise treatment sends radiation beams from several directions directly onto the brain tumor, killing it and sparing the rest of the brain from harmful effects of radiation. The therapy combines CAT scans and MRI to create pictures of the cancer that a computer then turns into three-dimensional images of the tumor exactly as it appears in the brain. These images are combined with computer-controlled radiation beams and meticulous positioning of the patient's treatment table. Radiation hits the tumor at precisely calculated angles and depths matching the 3-D image of the tumor, obliterating the cancer and sparing healthy tissue.

"Radiation is the most effective agent in the treatment of pediatric brain tumors," says Thomas Merchant, DO, PhD, chief of Radiation Oncology and principal investigator for a report on the

study that appeared in the August 2004 *Journal of Clinical Oncology*. "However, the advantages of radiation therapy are partly offset by the potential side effects, which range in severity and importance. Radiation may have devastating consequences to neurological, cognitive and hormonal systems affecting growth and development."

Oncologists have long recognized the powerful effect of radiation in eradicating tumors but have often tried to delay or avoid radiation by using surgery or higher doses of chemotherapy. With new advances in the world of radiation, many treating physicians welcome the reintroduction of radiation as a front-line treatment.

Results of the St. Jude study hold promise for sparing cognitive development even in extremely young children. Forty-eight of the 88 patients in the St. Jude study were under 3 years of age at the time of irradiation. Including

children in that age bracket was a unique aspect of the study, since those patients are at greatest risk to suffer radiation side effects.

"Our recent trials have been designed to reduce the volume of irradiation," Merchant says. "Most encouraging has been a reduction in side effects in many of the younger children for whom radiation therapy has been avoided for nearly two decades."

Investigators found that tumor control was successful for about 75 percent of the children with ependymoma. In previously reported studies, radiation therapy had enjoyed a success rate of only 50-60 percent. "The improved outcomes we have seen in both disease control and intellectual development using conformal radiation therapy suggest it might be possible to reintroduce the routine use of radiation therapy as a treatment option even for very young children," Merchant says.

On target

Louis Hentz is one child who hopes to benefit from conformal radiation therapy. Last April, during a routine checkup, doctors found that the 1-year-old had the brain tumor medulloblastoma. After undergoing surgery in Ohio to remove the tumor, Louis' parents, Mike and Kerin, began researching protocols, hospitals and ways to reduce the risk of Louis' tumor returning.

"In this whole process, we had the

some physicians to avoid the treatment. The Hentzes learned that most children with medulloblastoma have recurrences if they do not receive radiation therapy. "We thought that was too high of a risk," recalls Mike.

"We chose to bring Louis to St. Jude because we felt this hospital had more experience than anybody else in dealing with such young children with brain tumors," he continues.

At St. Jude, physicians treat medul-

other facility in the country," Merchant says. "Our results are used in the clinical trial designs for national and international studies. Our knowledge of radiation-related side effects expanded markedly with the results from our recent trials. We also have the largest team of radiation oncologists devoted uniquely to pediatric radiation oncology."

Merchant attributes the encouraging results from the study to three factors: the large number of patients who underwent

"There is no better place for radiation therapy because we treat more children than any other facility in the country."

ANN-MARGARET HEDGES



Toddler Louis Hentz is one of the patients who has benefited from conformal radiation therapy. "We chose to bring Louis to St. Jude because of the high success rate with younger children," says his dad.

loblastoma with conformal radiation therapy in addition to surgery and chemotherapy. Children with medulloblastoma under the age of 3 undergo a different kind of conformal radiation therapy than do patients with ependymoma. Kids with medulloblastoma receive treatment to the posterior fossa portion of the brain for two weeks; then treatment is limited to the tumor bed for three to four weeks.

In Memphis, scans showed that Louis' tumor was not completely gone, and he underwent another operation. "The tumor was much larger than the scans in Ohio had shown," Mike says. "I'm glad Louis had another surgery so we could start with zero tumor."

When Mike and Kerin read a July 2004 *U.S. News & World Report* story about conformal radiation therapy at St. Jude, they knew they had come to the best place. "That was a nice reinforcement that conformal radiation was

the right route for us," he says.

Now starring

St. Jude is currently the world's leader in the field of pediatric neuroradiotherapy. "From a treatment standpoint, there is no better place for radiation therapy because we treat more children than any

extensive surgery to remove most of their tumors before irradiation; the use of conformal radiation therapy to target tumors; and the relatively high dose of radiation that could be used without jeopardizing healthy brain tissue.

St. Jude will continue pushing the envelope of radiation and enhancing its brain tumor program with the addition of a new Integrated Patient Care and Research Building. The hospital broke ground for the 300,000-square-foot facility in August of 2004.

"The new facilities and equipment will enhance our ability to treat patients with brain tumors and will give us the opportunity to dedicate a room to one of the newer treatment devices under development that will take conformal radiation to the next level," Merchant says.

As for Louis, he is handling treatment well. "The nice part of this treatment for him is that the younger kids get to go first," Mike says. "So, it's early mornings of sedation, 30 minutes of radiation and about 20 minutes of waking up from treatment.

"After treatment he's a little grumpy at first, but he hasn't had much anxiety about it because he's so young," Mike continues. "We will never be totally comfortable with radiation, but we know it's the best option for him, and St. Jude is the best hospital for it."●



PHOTOS BY LAURA HAJAR

José Meléndez (at left) of Puerto Rico, college student Emily Miller (lower left) and 7-year-old Jylisa Luellen (below right) are only a few of the patients benefiting from osteosarcoma research and treatment at St. Jude. Two of the physicians involved in those efforts are (far left) Jeffrey Dome, MD, and (below) Najat Daw, MD, both of Hematology-Oncology.

Teaming Up to Battle Bone Tumors

Physicians and scientists attack osteosarcoma with an arsenal of strategies.

By Elizabeth Jane Walker

José Meléndez comes from a tropical island; Emily Miller from a bustling college campus. Like scores of others before them, these patients have come to St. Jude Children's Research Hospital to beat osteosarcoma, the most common type of bone cancer in children.

Patients with this disease are usually adolescents or young adults, with tumors in their legs or arms. At St. Jude, physicians and scientists are teaming up to boost survival rates for this disease while reducing treatment side effects.

Taking aim at tumors

José and Emily took part in the OS99 protocol at St. Jude. This treatment plan consists of intensive chemotherapy, followed by an operation to remove the tumor and then more chemotherapy to kill any surviving cancer cells.

OS99 differs from other treatment plans in the world because it uses a drug called carboplatin along with ifosfamide and doxorubicin. Carboplatin is easier on the kidneys and the hearing than drugs that have been used in past osteosarcoma treatment plans. The protocol also avoids high-dose methotrexate, which can harm the kidneys, liver and lungs.

Because it is located in a bone, an osteosarcoma does not shrink like a soft-tissue tumor would. Clinicians have only one reliable way to find out how well chemotherapy has killed cells—by looking at the tumor under the microscope after the cancer has been surgically removed. But St. Jude is using a new way to evaluate treatment response. Dynamic enhanced magnetic resonance imaging (DEMRI) is a special kind of MRI in which radiologists inject a contrast solution to help them examine the tumor.



“We are one of the pioneers in this type of research,” says Najat Daw, MD, of St. Jude Hematology-Oncology. “DEMRI can be used to assess the blood supply to the tumor. That information may help us improve therapy for osteosarcoma.”

The protocol benefits children far from Memphis, Tennessee. “The exciting thing about this study is that it’s the first therapeutic protocol at St. Jude to be done in collaboration with an international partner site,” Daw says. Nine patients in Chile are currently taking part in the study. Physicians in that country have regular videoconferences with St. Jude faculty to discuss treatment progress and other issues.

Surgical advances

Years ago, the only way to remove osteosarcoma was to amputate the affected limb. As survival rates increased, doctors sought ways to remove the cancer while improving patients’ quality of life. Today, St. Jude surgeons perform about 23 limb-salvage operations a year. In these surgeries, they replace diseased bones with prostheses. If a patient—such as Emily—has reached maturity, doctors anchor a super-

I’m excited about all of these collaborations. By studying the biology of this disease, we will be able to understand what causes osteosarcoma, the tumor’s characteristics and how we can treat it better.

strong “bone” made of cobalt and titanium to the patient’s existing healthy bone. But if a child—such as José—is still growing, surgeons use an expandable prosthesis, called Repiphysis® Expandable Implant.

In the past, surgeons operated on young patients each time they had a growth spurt. Although some prostheses were expandable, children had to undergo surgery for the expansion to occur. “If kids had the potential to grow four or five inches, we’d have to operate on those kids four times,” recalls surgeon Bhaskar Rao, MD. “Then you had the risk of infection and bleeding, plus you had to start all over again with weeks of rehabilitation.”

With the new prosthesis, a donut-shaped coil emitting an electromagnetic field is held around the child’s limb. This magnetic field heats a plastic tube within the prosthesis. As part of the tube melts, an internal spring uncoils and the prosthesis lengthens. In the late 1990s, Rao and his colleague Michael Neel, MD, began using Repiphysis® at St. Jude. To

date, they have implanted 36 of the devices. Rao has even traveled to a St. Jude partner site in Lebanon to teach surgeons how to perform the operations. St. Jude physicians are also investigating whether they can reduce the amount of normal bone that is removed during surgery, so that children can keep more of their natural bone when prostheses are implanted.

Victory in the trenches

If the osteosarcoma has not spread, children with the disease have about a 75 percent chance of survival, compared with about 20 percent in the early 1960s. Treatment has not changed much in the past 15 years, mostly because this kind of cancer is not very sensitive to chemotherapy. The laboratory may hold the answer to better cure rates.

A recent discovery by a team led by Jeffrey Dome, MD, of Hematology-Oncology has moved investigators one step closer to identifying patients who are at higher risk of death or tumor recurrence. By looking at osteosarcoma tumor samples from 51 children, Dome and postdoctoral fellow Robert Sanders, MD, found that patients whose tumors express the

telomerase gene are at higher risk of having a bad outcome than children whose tumors do not express the gene.

Telomeres are DNA sequences that cap the ends of chromosomes. In normal cells, telomeres serve as a kind of

molecular clock. Telomeres shorten each time cells divide, eventually becoming so short that the cell knows it’s time to stop dividing. In cancer cells, an enzyme called telomerase maintains telomere length, and the cell continues to divide with abandon.

Although most cancers express telomerase, many osteosarcomas do not; most of them use a process called “alternative lengthening of telomeres” (ALT) to maintain telomere length. “We found that when these tumors do have telomerase, they are harder to cure,” Dome says. This finding appears in the September 2004 edition of the *Journal of Clinical Oncology*. Results of the study could help physicians identify ways to modify therapies and increase survival rates for kids whose tumors express telomerase.

“I’m excited about all of these collaborations,” Daw says. “By studying the biology of this disease, we will be able to understand what causes osteosarcoma, the tumor’s characteristics and how we can treat it better.”

Finding Help Far from Home

José Meléndez’s eyes shimmer like the sea, awash with the colors of his surroundings. “My eyes change depending on what I wear,” says the precocious 11-year-old. Glancing around, José flashes a smile that’s guaranteed to melt female hearts a few years hence. A cologne connoisseur and an expert dancer—he prefers merengue and salsa—José is most definitely a teenager-in-training.

Three years ago, the spirited young man faced an uncertain future. Doctors in Puerto Rico found a tumor and wanted to amputate his right leg. His mother, a single parent, was terrified at the prospect of losing her only child. Then their family doctor called St. Jude Children’s Research Hospital. Within four hours, José was accepted into the hospital’s osteosarcoma protocol. Although they were worried about leaving their family and home, José and María resolutely boarded a jet and arrived at St. Jude on Christmas day.

María had envisioned a place where she would face language barriers and stressful medical decisions alone. She was surprised to find that she and José were quickly enveloped in a community of caring people. “I had a lot of emotions when I came,” she says. “I had fear; I had hope. But all the people at St. Jude were helping us—the nurses, the doctors, other families. They cried with me; they laughed with me; they shared every single moment. I didn’t go through it by myself.”

Right away, José began a grueling regimen of chemotherapy. “I felt very bad and the chemo made me sick the whole time,” José recalls. “I lost too much weight, and I was always tired and dizzy.” At one point, his lungs collapsed, and he went to the Intensive Care Unit. “I thought I was going to die,” José admits solemnly. Then, with a brilliant smile, he adds, “But no! Here I am!”

Surgeons at St. Jude removed José’s entire femur, the upper bone in his leg, and replaced it with an expandable prosthesis. He spent months re-learning how to stand, and then walk, while undergoing even more chemotherapy. For the year that he lived at Target House, José also kept up with his studies through the St. Jude School Program.

Today, José is an active, lively sixth-grader who says his prosthesis doesn’t slow him down much. “I jump, but I cannot slide to hit the ball when I play volleyball,” admits José, who is also an enthusiastic basketball player. His active lifestyle is balanced by an intelligence and determination that give José an advantage in the academic arena. In fact, the mayor of his home-



LAURA HAJAR

SETH DIXON

Surgeons at St. Jude removed the upper bone in José Meléndez’s leg and replaced it with an expandable prosthesis. But osteosarcoma didn’t slow José down for long. While he was at St. Jude (above), José danced and worked hard at his physical therapy. Today, the 11-year-old enjoys playing volleyball and basketball and demonstrating the nuances of merengue and salsa on the dance floor.

town presented José with an award for making an A in every class for five consecutive years—even while he was in Memphis undergoing treatment. José is contemplating a career as a computer technician or physician. “If I’m a doctor, maybe I can work at St. Jude,” he says.

María’s eyes follow José’s every move, sometimes welling with tears, always shining with pride and gratitude. “I brought José here for life,” she says. “Thanks to God, and thanks to St. Jude, my child is alive today.”

Determined to Live

She was an athlete, accustomed to pushing mind and body to excel. Then cancer struck. Instead of accepting the disease meekly, Emily Miller attacked it like she would a soccer ball in a hotly contested match.

“Cancer picked the wrong body,” she proclaimed. “Ninety percent of what happens to you is due to your attitude. Well, I have plenty of that!”

Two years ago, Emily was a member of her university’s soccer team. She trained rigorously, avoided alcohol and tobacco, and consistently made the Dean’s list. Gradually, her left leg began to hurt. When the pain worsened, Emily sought medical help. She was totally unprepared for a diagnosis of osteosarcoma. But the determination that helped her vanquish opponents on the soccer field shone through.

“I had to make a conscious decision,” Emily reflects, “whether I was going to lie there and die, lie there and just make it, or get up and win. I chose to win.”

In April of 2003, Emily began treatment at St. Jude Children’s Research Hospital. During the next 10 months, she endured endless rounds of chemotherapy and an operation to remove her knee and most of her femur and tibia. Surgeons replaced these bones with a prosthesis that extends from her upper thigh to just above the ankle.

After the operation, Emily had to “teach” her leg to respond to her commands. She worked extremely hard, and was able to cast aside her brace and crutches only four weeks after surgery. As an athlete determined to regain her mobility, Emily continued going through difficult physical therapy every day for months. “It paid off, because I have unbelievable flexion and extension now,” she says.

Meanwhile, Emily’s teammates upheld her with prayers, cards, and even a trip to Memphis on their team bus. Students organized a St. Jude race in her honor, a tradition that will continue in the future as the Miller Mile Marathon.

“I made it to the race last year,” she says. “My counts were really low and I had very few platelets, but I went anyway. I just had to do it. I shot the gun at the start, and I slapped every hand as they came across the finish line.”

Emily returned to college in fall of 2004. She finds immense joy in the day-to-day routine of attending classes and serving as the soccer team’s assistant coach.

“One thing I learned,” she says. “When it comes to life, you only go around once. But if you do it right, once is enough. That’s what I live by every day. Often, I’m out on the soccer field with my eyes closed behind my sunglasses, and I’m just sniffing the air and feeling the grass and enjoying being alive.”

In spring of 2004, the National Collegiate Athletic Association presented Emily with the NCAA Inspiration Award for her ability to persevere and serve as a role model for others. When she graduates from college, she hopes to channel her enthusiasm and skills into a career at ALSAC, the hospital’s fund-raising organization. But for now, Emily helps one patient at a time. St. Jude nurses and physicians often ask her to speak



“Cancer picked the wrong body,” said Emily Miller, pictured at home, at her end-of-chemo party and on the soccer field. She approached cancer with the same determination she had exhibited during competitions. Emily won the National Collegiate Athletic Association’s 2004 Inspiration Award for her ability to persevere and serve as a role model for others.

with patients who are having difficulty. “I have an undeniable urge to help other people in my situation and to make them aware that they, too, can choose to fight,” Emily says. “There are miracles riding tricycles all over this hospital. Anywhere else you go, they treat you like a medical case. Here, you’re a person; you’re a name; you’re a face. You’re loved.

“Patients just need to know that if they choose to get up and fight, that everybody at St. Jude’s going to be there to help push them along.”●

Time to Give Back

BY BETH MCGOWAN

ANIN-MARGARET HEDGES



One evening many years ago, a young couple sat spellbound in a darkened theater as entertainer Danny Thomas eloquently described his dream. Thomas explained that he wanted to build a children’s hospital that would be unlike any other in the world. Today, Les and Lois Lewis have embraced that dream, investing time and effort into raising funds for St. Jude Children’s Research Hospital.

“When things calmed down for us personally, we wanted to give something back to the world. St. Jude immediately came to mind.”

An exciting career path took them from the nation’s capital to the world’s oil capital, with colorful adventures in between. But Les and Lois Lewis say one of their most rewarding experiences has been supporting the work of St. Jude Children’s Research Hospital.

That relationship was born in the late 1950s, when the couple attended a show in Washington, D.C.’s Constitution Hall. They were captivated by entertainer Danny Thomas, who was describing his plans to build a shrine to St. Jude.

Les vividly remembers listening to Thomas talk about his dream of building a unique hospital devoted to curing catastrophic diseases in children. “Danny’s enthusiasm was amazing,” Les recalls. “He had been traveling around the country speaking about his dream and gathering entertainers and businessmen to support this cause. All who attended the event were struck by his wonderful devotion.”

“That night the seed was planted for our later fund-raising efforts for St. Jude,”

he continues. “As we all know, life goes on, and we get involved with the business of living, raising families and working.”

After Les graduated from Georgetown University, the couple spent two years at the U.S. Consulate General in Dhahran, Saudi Arabia. Returning to the United States, Les attended law school and then joined Aramco (now called Saudi Aramco), which sent them back to Saudi Arabia. In 2000, Les retired from that company after having spent 35 years as its legal counsel. “When things calmed down for us personally, we wanted to give something back to the world. St. Jude immediately came to mind,” he says.

The Lewises’ involvement with St. Jude has been greatly influenced by their friendship with Richard Shadyac, chief executive officer of ALSAC.

“I first met Dick in Washington, D.C., when he was the captain of our bowling team,” Les says. “To my knowledge, Dick’s efforts to teach me how to bowl are the only thing at which he has ever failed!

We have always known that whatever activity or organization Dick would head would be efficient and well-run.”

Now married 47 years, Les and Lois have worked tirelessly to raise money and awareness for St. Jude in the Houston, Texas, area. Lois has chaired four annual “Fly Me to the Moon Galas” in Houston. These events have raised nearly \$500,000 for St. Jude.

The Lewises have also hosted receptions in their home, where new donors and companies learn how they can support St. Jude. And three of the Lewises’ grandchildren have baked cookies, gone door to door asking for donations, held garage sales and supported St. Jude in a variety of other ways.

“We’ve had a very blessed life,” Lois says. “We have a wonderful family of two sons and two daughters, 12 grandchildren, numerous good friends and now, the opportunity to lend our support to such a wonderful organization as St. Jude.”●

To learn about ways to give, call ALSAC Gift Planning at (901) 578-2081 or toll free at (800) 830-8119 ext. 2425.

Perspective

Focus on Hope

Members of award-winning country music group Lonestar share their impressions of the research and treatment occurring at St. Jude.



Visiting with St. Jude patient Hayley Arceneaux are (from left) Keech Rainwater, Dean Sams, Richie McDonald and Michael Britt.

Michael Britt guitar, vocals:

As recording artists, we're asked to lend our name to many deserving charity organizations in an effort to raise money and awareness. I went to St. Jude expecting to be, well, depressed, but seeing all of the staff working so hard for these kids was anything but depressing. The sad part is that children are still being afflicted by these terrible diseases, but the inspiring part is that they have a place they can go, regardless of their financial stations. More children are surviving diseases than ever before, and more treatments are being developed all the time.

It still breaks my heart to see the kids struggling with cancer and other horrible diseases, but I am so glad that St. Jude exists. It truly is a light of hope in the darkest of times.

Richie McDonald lead vocals:

Over the past 10 years, we have grown rather close to St. Jude. We've seen firsthand the miracles they are performing for these precious little angels, all God's children.

You ask what St. Jude means to me? I can sum that up in one word: hope. Hope for those who need it the most;

hope for all the children and their families. They know that in their time of need they can find comfort and count on all the wonderful people at St. Jude.

Dean Sams keyboards, vocals:

Before I ever went to St. Jude, I wanted to know several things. What are they about? Why do I need to give my money? Does the money really go to the kids? Are they really helping kids live?

After one visit, every question was answered. I met kids who had smiles on their faces because they had hope that tomorrow would come. I met parents who could laugh and joke with their children because of the miracles that St. Jude staff members make happen every day. I met doctors and researchers who told us of the great advances they make because of donations made by "Partners in Hope."

One visit changed my life forever.

St. Jude is "hope," "compassion" and "love" all in one. Because of this I am very proud to say I'm a Partner in Hope and a supporter of St. Jude.●

Lonestar has received numerous awards and recognition from the Academy of Country Music, the Country Music Association, the National Academy of Recording Arts and Sciences and the American Music Awards. They have also received The Home Depot Humanitarian Award, which recognizes country music artists for community service and generosity.

ANN-MARGARET HEDGES



In the name of love

During a tour of the hospital, rock star Bono meets St. Jude patient Luseane Kahaulelei Pese, who hails from American Samoa. Bono, vocalist for the Irish group U2, was in Memphis to accept the International Freedom Award from the National Civil Rights Museum. Through the years, Bono has used his celebrity status to make people aware of AIDS and other crises facing Africa. "I know a rock star with a cause can be a scourge, but when there are 11 million African children who are orphans because of AIDS it is not a cause—it is an emergency," he said. During his tour of St. Jude, Bono met with Julia Hurwitz, PhD, of Immunology and Karen Slobod, MD, of Infectious Diseases, who are co-developers of the St. Jude multi-envelope HIV vaccine.

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