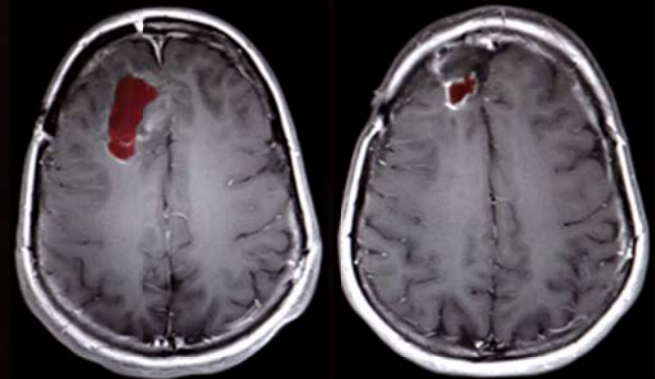


Killing Cancer with Polio

Battling an aggressive brain tumor at 20, Stephanie Lipscomb was told she had six months to live. So she bet her life on an experimental treatment

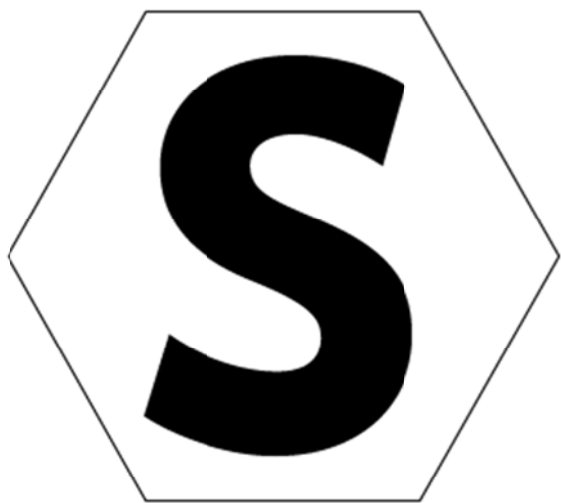
By Michelle Boudin and Alicia Dennis



Before Treatment
April 16, 2012
Lipscomb's 27x12 mm. tumor on her MRI scan.

After Treatment
Jan. 31, 2014
An MRI shows only scar tissue remains.

Photographs by Steve Pyke



Stephanie Lipscomb was dying. A malignant tennis-ball-size tumor pressing into the right frontal lobe of her brain had shattered the 20-year-old nursing student's future. Even after doctors removed the mass—a stage-4 glioblastoma in June 2011—and she underwent months of chemotherapy and radiation, it came back. In agony from blinding headaches, Lipscomb and her mom, Kelli Lusk, listened as doctors presented a shocking option: an experimental treatment never before tried in humans, in which they would infuse a genetically altered version of the dreaded poliovirus into Lipscomb's tumor in a last-ditch effort

to destroy it. Kelli, 43, was horrified. "They're going to put polio in my child?" she recalls thinking. "After all she's been through?" But Lipscomb jumped at the chance. "I just knew," she says, "this wasn't the end of my story."

Two years later, amazingly, she's alive, and cancer-free, to tell it. The unlikely treatment, pioneered by Dr. Matthias Gromeier at Duke University (see sidebar), has helped extend the lives of a handful of similar patients—and encouraged medical researchers who believe viruses can be used to target and attack different types of cancers. But progress requires test subjects willing to endure the potential risks—which in Lipscomb's case ranged from limb weakness to death from infection. "She was the first person in the world to get the poliovirus in her brain," says Gromeier, 48, an associate professor of neurosurgery and molecular genetics at Duke's

Preston Robert Tisch Brain Tumor Center. "She was very courageous."



She was also fully conscious. Sedated while doctors drilled a pea-size hole into her head and inserted a catheter into her brain, Lipscomb was wide-awake during the 6½-hour procedure on May 10, 2012. Flanked by her mom and stepfather Brian Lusk, she watched *The Help* on her laptop and read the third book in *The Hunger Games* series. Still, feeling the chill of the virus-laden saline solution flowing into her frontal lobe, she says, "I was very, very scared."

'I was a little crazy to do this. But I feel grateful to be alive and give others hope'

It was a rare shaky moment for the sunny girl next door whose life until that point had taken a happily ordinary path. The oldest of four sisters growing up in a churchgoing family from Seneca, S.C., Lipscomb, who played softball and ran high school track, decided early on to pursue a career in medicine after babysitting

One Doctor's Mission

Twenty years ago Matthias Gromeier set out to study the poliovirus “for nerdy, scientific reasons.” By accident he discovered that the virus appeared to be lethal to cancer cells while leaving other cells unharmed. At first colleagues thought his idea—infusing poliovirus into a tumor—was outrageous. “If everybody thinks you’re nuts,” he says, “that’s a good sign.” The therapy, called PVS-RIPO, will require years of further testing, but Gromeier hopes it will provide an alternative to chemo, which his mom, Anne Marie, was given before succumbing to esophageal cancer at age 68. “It was horrific, worse than dying,” he says. “I want to do something different.”

cancer.duke.edu/btc/



A Risk and a Prayer

Lipscomb receiving the poliovirus (right) and with Gromeier and Dr. Annick Desjardins (above) at a January checkup.



Tough Medicine

“It’s very emotional,” Gromeier (holding samples of his poliovirus in his lab) says of watching Lipscomb’s recovery.



a sick child. Starting nursing school at the University of South Carolina Upstate, she joined a sorority, waitressed part-time and met boyfriend Matthew Hopper, 22, a business major with whom she began planning a future. After her grades took a nose-dive and a slip in the shower sent her

to the emergency room, a scan revealed the tumor. "I was like, 'No, that's not right,'" Lipscomb says. Her mom bypassed denial. "I went to pieces," says Kelli, a housekeeper. "Two of my friends drove me to the hospital. I crawled into bed with Stephanie. I wanted to hold her."

Happy and Healthy

"I'm so grateful," says Lipscomb (with mom Kelli). "I don't take the little things for granted."

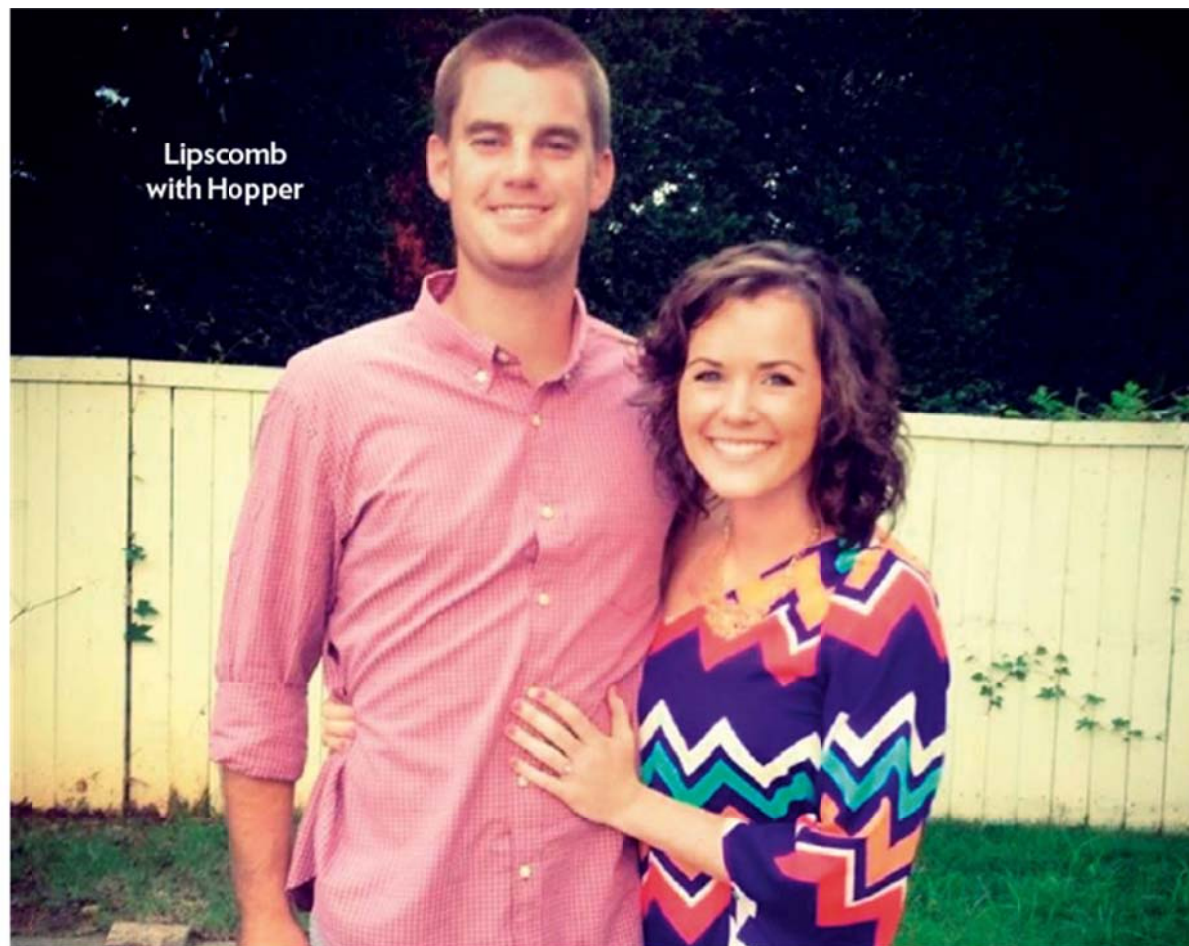


Determined to get on with life, Lipscomb

dove back into her studies after taking the semester off. But chemo and radiation left her exhausted and sick. "I was brushing my hair in the bathroom at my boyfriend's apartment, and it started coming out in clumps," she says. "I completely broke down. [Hopper] came in and said, 'It's going to be okay. I'll be here for you.'" Then, in April 2012, she had a seizure. The cancer was back. Doctors gave her less than six months. "I cried. But I never thought I was going to die," says Lipscomb, who read the Bible for inspiration. She pictured the life she planned with Hopper. "I wanted a house big enough for my family," Lipscomb, now 23, remembers thinking, "and two or three kids. I love kids."

That single-minded optimism came in handy when doctors brought up the

FDA-approved poliovirus trial. Deeming Lipscomb a good candidate because of her youth and overall good health, they suggested she “take a minute” to discuss the decision with her family. “I don’t need a minute,” Lipscomb told them. In the days following the procedure, it seemed she might have acted in haste. Massive swelling in her brain frightened her and gave her doctors cause for concern—it looked as if the tumor was growing. But days later, tests revealed scar tissue where cancer cells had been, and the swelling was inflammation from her immune system kicking in. The tumor was shrinking. Mother and daughter hugged each other and wept. “I was very, very excited,” Lipscomb says. Follow-up scans showed further shrinkage and, finally, not a trace of cancer. “We have nothing to compare this to,” says Gromeier, an affable man with a thick German accent, who says of Lipscomb, “I literally think about her every day.” He cautions that the trial is small and still in early stages—



and that brain tumors are one of the hardest cancers to treat. “We can’t ever say 100 percent,” he says, “but we believe she will survive this disease.”

Lipscomb is counting on it. Sitting in the passenger’s seat next to Kelli during the three-hour drive to Duke for her checkup in January, she laughed and chatted about a baby shower they

were planning for Lipscomb’s sister Lauren and about her upcoming stint as a nursing assistant in Duke’s pediatric oncology unit. She’s growing her hair out again—it already covers the tiny scar on her scalp that serves as the only physical reminder of her ordeal. “My intuition tells me,” she says, “I’m going to be fine.” •