His name was Charles, and he’d survived a horrific accident that had killed most of his family: their home had been destroyed when a tank of propane cooking fuel exploded, taking the lives of his parents and four of their seven children. Suffering third-degree burns over some 25 percent of his body including his chest, hands, and entire face, the twelve-year-old had traveled 170 miles to Weill Bugando Medical Centre in Mwanza, Tanzania, for treatment—but given its limitations of equipment and training, there was little the staff could do but clean and cover his wounds. By the time burn surgeon James Gallagher, MD, saw Charles, eight days after the explosion, his bandages were tinged green with infection. “His life was definitely threatened,” says Gallagher, the leader of a Weill Cornell team that visited Mwanza last March.

More Than Skin Deep

On a service trip to Tanzania—where burn injuries are common and physicians are few—Weill Cornell surgeons and nurses aimed to help colleagues at Weill Bugando

By Beth Saulnier
Photographs by David Chalk

His name was Charles, and he’d survived a horrific accident that had killed most of his family: their home had been destroyed when a tank of propane cooking fuel exploded, taking the lives of his parents and four of their seven children. Suffering third-degree burns over some 25 percent of his body including his chest, hands, and entire face, the twelve-year-old had traveled 170 miles to Weill Bugando Medical Centre in Mwanza, Tanzania, for treatment—but given its limitations of equipment and training, there was little the staff could do but clean and cover his wounds. By the time burn surgeon James Gallagher, MD, saw Charles, eight days after the explosion, his bandages were tinged green with infection. “His life was definitely threatened,” says Gallagher, the leader of a Weill Cornell team that visited Mwanza last March.
Gallagher and his colleagues—including surgical resident Katrina Mitchell, MD, three nurses, and a rehabilitation therapist—spent three weeks working side by side with Bugando staff. They demonstrated approaches such as employing tourniquets to minimize blood loss during surgery, the use of skin grafting instruments, and the vital role of rehab in recovery. “Everyone knows that Africa is suffering and that there aren’t enough doctors—but what does that mean?” muses Gallagher, who spent a year doing general surgery in the sub-Saharan region a decade ago, before specializing in burns. “Well, it means that things present very late. In the hospital there are lots of kids with open burn wounds who’ve been there for months, but the surgeons don’t operate on them because they don’t have the proper tools, they have no track record of success, and the hospital has many patients with other surgical problems needing care. The surgeons focus their time and effort on problems they know they can solve, and the burn patients often get discharged with open wounds.”

Even in the developed world, extensive burn injuries can be devastating. In addition to requiring multiple surgeries and intensive postoperative care, such injuries often raise difficult emotional and practical issues. Despite successful treatment, burns—especially to the face—can mean permanent disfigurement, with all the psychological damage that entails. Burns to the hands can cause dexterity problems that impede patients from performing everyday tasks or even earning a living.

And if burns aren’t properly treated in the hours, days, and weeks following injury—as they rarely are in the developing world—the outcomes are infinitely worse. Patients endure chronic wounds in which granulation tissue—which, under normal circumstances, plays an essential role in the healing process—is never covered by healthy skin; they suffer contractures in which scar tissue forms and hardens, fusing fingers together or even sealing limbs to the body. “The granulation just keeps growing; we’ve seen adults with chronic wounds remaining from childhood,” Gallagher says. “It’s pretty terrible. In the community you see all of these horrible contractures, and the anatomy underneath is completely deformed.”

Gallagher and his team hoped to counter that—not by sweeping in and treating a few lucky patients over the course of a few weeks before jetting home again, but by helping Bugando’s staff develop its own burn-treatment infrastructure. “The best thing you can do,” Mitchell says, “is try to strengthen the local institution by improving care protocols and the ways they educate themselves and their colleagues.” In fact, Mitchell notes, these days one-off “mission trips” by Western medical teams—while clearly gratifying to the participants themselves—are increasingly understood to be of limited benefit; they can even be counterproductive, by introducing conflicting treatment protocols or providing equipment that local staff aren’t trained to use or maintain. “Traveling to a place for a few days, taking care of a few patients, and leaving does very little to improve an institution or local health care,” she says. “It is more important to direct funding and human resources into sustainable projects that will affect hundreds or even thousands of patients into the future.”

In a video chronicling the Bugando trip, Gallagher notes that while there is one doctor for roughly every 350 people in the developed world, in Africa the proportion is one for every 33,000. Only a fraction of those MDs are surgeons—and severe burn injuries are
surgical cases. Tanzania has just one dedicated burn unit, located in the capital city of Dar es Salaam, more than 1,000 miles from Mwanza. “Apart from the paucity of human resources,” says Kenley Cai, MD, a lecturer and general surgeon at Weill Bugando who is spearheading the improvement of burn treatment at the hospital, “there are inadequate facilities for resuscitizing acute burn injury, consumables for dressing burn wounds, shower tables, proper surgical instruments, and facilities for rehabilitation therapy.”

While treatment resources are few, the need is acute: burn injuries are heartbreaking common in Africa, where cooking is mainly done around open fires. Those fires are often low to the ground—at child height—and many pediatric injuries involve scalding by hot water, tea, or porridge. “You have unprotected kitchens, and you also have the fact that people are boiling water to make it drinkable,” Gallagher says. “So there’s a lot of boiling going on and a lot of cooking in what we would call unsafe conditions. When I lived in Africa the first time, the conclusion I draw is that for much of the population it’s like long-term camping. If you picture yourself camping, sleeping on the ground and cooking over an open fire—that’s what it’s like to live in much of Africa.”

The Mwanza burn efforts began with a meeting between Gallagher and Mitchell, who was in New York on leave from a two-year stint at Weill Bugando, where she was working on surgical education development. Gallagher, with his dual interests in burn medicine and global health, asked about the state of burn treatment at Bugando—an institution that is not only affiliated with Weill Cornell but shares a common benefactor in Sanford Weill. “She said, ‘There’s really nothing going on with burns,’” he recalls. “But she knew a surgeon who would be a good candidate to lead the charge and be the person who invites us—because we want to work with the surgeons on the ground and say, ‘What do you guys need? We’re your partners.’” Cai signed on, and in August 2011 Gallagher and Mitchell—who eventually opted to stay in Tanzania for a third year to work on the burn program—took a two-week fact-finding trip to assess the state of burn treatment at the hospital, from operating rooms to nursing staff to the kitchens that provide nutrients; they even visited the local fire department.

During the March trip, which also included a volunteer photographer, the team focused its efforts on a half-dozen severely injured pediatric patients. They included Charles—on whom they performed successful skin grafts, including a dramatic repair of his face—and a girl of toddler age who’d fallen face-first into hot coals; an additional $120,000. “Over the next few years, quarter by quarter, it will build upon itself and be a model or proof of concept that can be taken anywhere,” Mitchell says. “To say, ‘If you’re a care provider in these developing countries could treat them successfully.’ At the hotel in Mwanza you’d run into other visiting physicians, and many of them were overwhelmed and frustrated that they can’t change anything,” Gallagher says. “I’m grateful that I don’t feel that way: I’m excited because I feel that we have a practical solution and can help the local African surgeons to save the suffering from burn injury in their people.”

According to Cai, Weill Bugando has indeed begun to make progress in bettering its burn treatment since the March trip. “Dr. Gallagher’s burn team demonstrated to us the role of a multidisciplinary approach in treating burn injuries,” he says. “We have started to involve other specialties like rehabilitation therapists in managing burn patients. In deep burn, we are advocating early surgery by tangential excision and early skin grafting. In the past, the practice was to delay surgery until after skin granulation had taken place, which was associated with long hospital stays and bad aesthetic outcomes.”

The ultimate goal, Gallagher says, is to establish a dedicated burn unit in Mwanza. Weill Cornell will continue to offer training and support, including the development of surgical simulators; Gallagher is currently conducting a study on the efficacy of a low-tech simulation system for evaluating and training burn surgeons. In November, he and his team learned that they’d been awarded a $191,000 grant from the EMA foundation for the pilot phase of developing a pediatric burn unit, including reorganizing surgical spaces and establishing care protocols for nursing and rehabilitation. Dean Emeritus Antonio Gatto, MD, MPH, has pledged to spearhead fundraising of an additional $120,000. “Over the next few years, quarter by quarter, it will build upon itself and be a model or proof of concept that can be taken anywhere,” Mitchell says. “To say, ‘If you’re a care provider interested in burns, this is the stepwise way to go about establishing a burn center anywhere in a resource-limited environment.’”

Now a senior resident in the Weill Cornell general surgery program, Mitchell ultimately plans to practice internationally, most likely in trauma and critical care surgery. “It’s challenging in a different way than working in the States,” she says of practicing in developing countries. “It makes you think more practically and utilize all your resources. Most of all, it’s incredibly rewarding. Patients are grateful, you have wonderful relationships with your colleagues across disciplines, and it brings your work back to its roots. In Africa, I felt like medicine was a joy.”