WHAT MATTERS

By Meredith J. Sorensen, M.D.

When a Dartmouth surgery resident arrived in Tanzania for a four-week rotation, she was at first horrified by the conditions she found there. But as the weeks passed, she came to appreciate the constraints, and to realize what really matters in medicine.

My first case at Saint Francis Designated District Hospital in Ifakara, Tanzania, was to close a hippo bite. That might sound funny at first. Before my arrival in rural east Africa, my mental image of hippopotami was of the smelly, sedentary creatures floating in the pond at the pachyderm house, or of Disney's goofy, animated oafs doing the can-can in pink tutus.

But hippo attacks are no joke in Ifakara, where fishing boats share the Kilombero River with the aggressive beasts, whose massive jaws can inflict gaping, dirty wounds. A hippo bite typically stays open for weeks or even months, healing slowly from the inside out, before it is finally ready for a skin graft.

In Faraji's case, the surgical team decided his wound was "small" enough that he did not need a graft—the skin edges could simply be pulled together and the wound stitched closed. In principle, this was a good idea, but Faraji's wound was not actually "small." His entire left knee was exposed, and a large pink lump of tissue bulged out of the middle of the wound. Granted, I had completed only two years of my surgery residency, but I had never seen an injury so large sutured closed. But obedience is a virtue residents must possess no matter where in the world they are, so I arrived in the minor operating theatre ready to do the case. I rinsed my hands in cold water (that section of the hospital had run out of soap), pulled an industrial plastic apron over my street clothes (scrubs weren't used in the minor theatre), and waited for the patient to arrive.

Faraji hobbled in from the ward by himself and lay down on the narrow, unpadded, metal operating table. Sister Immaculata, the nun who served as the all-in-one operating theatre secretary, circulating nurse, and scrub tech, started an IV and injected a small dose of ketamine to sedate our patient. Then she sloshed a little iodine over his wound and handed me a scalpel and a too-large pair of forceps. I began to explore the wound. As soon as I gripped the skin, our groggy patient flinched. I asked for some local anesthesia.

"He does not need it, Doctor," Sister Immaculata replied. Realizing that maybe they did not have any, I regripped the wound edge.

The Kilombero River's placid surface belies the ferocity of the hippos who lurk beneath.

Saint Francis is the only hospital serving a region almost as big as Vermont and New Hampshire.

I had been excited to visit a new part of the world and to see surgical pathology that does not exist in New England, and I had craved the autonomy that often accompanies international medical experiences. But now that I had it, I was scared.

This time, Faraji jerked his knee away. "Sister," I said, "I don't think this case will be possible without more anesthesia. Do you have *anything* else we can give him?" She reluctantly opened a drawer filled with vials of lidocaine, drew up a syringe-full, and returned the half-empty vial to the drawer.

As I injected the lidocaine, two Tanzanian interns arrived to watch "the American surgeon" operate. While interns in Tanzania have officially completed medical school (a five-year program after high school), they are more like third-year medical students in the U.S. They do not get much clinical experience in medical school, and their intern year involves two-month rotations through each major medical specialty. However, unlike third-year medical students in the U.S.—and residents, for that matter—interns in Tanzania have near-total responsibility for patient care. They are largely unsupervised during their internship and after just one year of training are free to practice on their own. As a still-very-junior resident in U.S. terms, I was amused by their perception of me as a specialist.

Once the local anesthesia had taken effect, I began elevating the skin edges away from the wound—a bloody process without electrocautery. It didn't take me long to realize that the skin simply would not stretch far enough to cover the wound. And while the pink bulge in the middle of the opening was probably just granulation tissue, I thought I could see muscle fibers along the side of it. I worried that further dissection of the tissue might disrupt the quadriceps tendon and permanently impair the patient's ability to bend his knee. Cautiously, I probed a little further, then stopped. "What is wrong?" one of the interns asked.

I explained my concerns and told them I thought Faraji would be better served by a skin graft. I asked if one of them could call the attending so I could get his advice. Much to my surprise, both interns started laughing. "The attendings are not available in the afternoons," one said. "And asking them for help is a sign of weakness." As someone accustomed to attendings overseeing my every move, I was shocked. But I halfheartedly resumed my attempt to mobilize enough skin to get it to miraculously meet in the middle. The further I got from the wound's edge, the less effect the local anesthesia had; the patient started to fidget and groan. I paused and asked for more lidocaine. Sister Immaculata said no. The other intern said, "Continue. In order to become a surgeon, you must have the heart of a lion." I poked at the wound a little more, but ultimately I was not lion-hearted enough to persist. My conscience would not let me cut any more.

The intern pulled on some sterile gloves (but without observing sterile procedures) and grabbed the scalpel from me. Roughly and unevenly, he sliced at the subcutaneous tissue. The wound filled with blood. "Blot!" he commanded me. The skin still didn't cover the entire wound, so he began cutting off pieces of the bulge. The patient's groans turned to urgent moans, then screams, and he writhed on the table. Sister Immaculata and the other intern held him down. "Can you give him some more medicine?" I asked again.

"He doesn't need it. I am almost finished," the intern with the scalpel said. He tugged at the skin, finally forcing it together, and told me to push from my side while he started to sew. The first stitch was under so much tension that it snapped as soon as he started to place the second one.

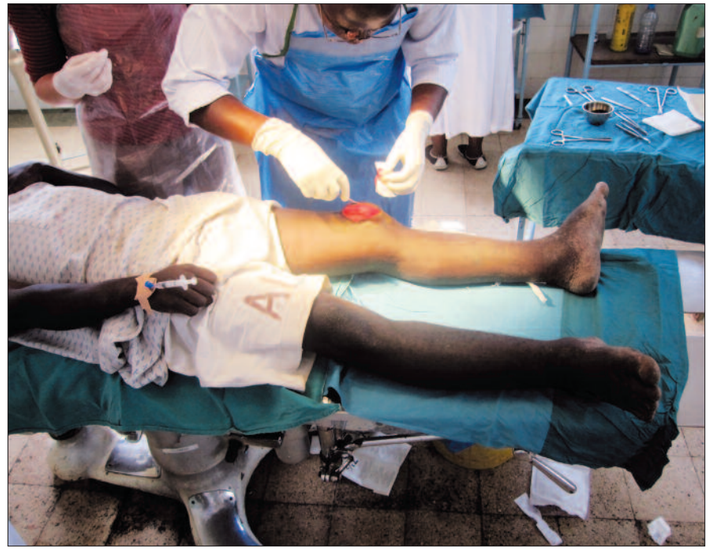
"This is not right," I said. "Why don't we just wait a few days and bring this guy back for a skin graft?" The intern shook his head and kept placing too-tight stitches. Faraji's black skin turned white.

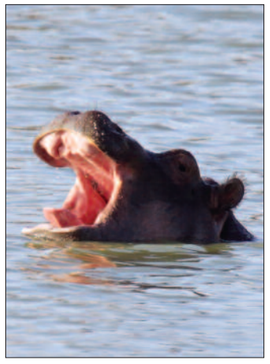
No longer feeling comfortable participating in the procedure, I left the room. As I walked down the hall, I wasn't sure if the screams I heard from the operating theatre were real or in my head.

Over the next few days, I wondered if I should stay. I was unsure how to reconcile my sense of professional responsibility with my role as a respectful visitor in a hospital with its own hierarchy and culture. As a physician who'd already taken the Hippocratic Oath, I was more than a spectating medical student. But as a junior resident, I had neither the credibility to question the interns' clinical decisions nor the skill to teach them how things should be done. I had been planning this month-long rotation for almost a year. Not only had I been excited to visit a new part of the world and to see surgical pathology that does not exist in New England, but I had craved the autonomy that often accompanies international medical experiences. But now that I had it, I was scared.

Saint Francis Designated District Hospital is the only hospital serving a population of about 600,000 people in the Kilombero and Ulanga districts of southwestern Tanzania—an area about the size of Switzerland (or just a little smaller than Vermont and New Hampshire). Officially the hospital has 371 beds, but in practice there are often well over 400 inpatients. Pediatric patients commonly share beds, and doubling-up occurs on the adult wards, too, when they're full. Even during so-called uncrowded periods, there isn't much privacy. For the entire month I was at Saint Francis, each of its four long, hallway-like surgical wards was filled to capacity. Nothing—not even a curtain—separates the beds from one another. Flies buzz around leftover food, unemptied bedpans, and infected wounds. People with malaria, leprosy, and HIV occupy the same wards as those with femur fractures, enlarged prostates, and dental abscesses. Six "specialists" (two general surgeons, two obstetrician-gynecologists, one internist, and one pediatrician), eight interns, and 12 "medical officers" (similar to physician assistants or nurse practitioners in the U.S.) take care of everything.

With ratios like that, I soon realized why the physicians there, attendings and interns alike, could not invest a lot of energy in individual patients. Even so, once I decided that I could, would, and should stay, that mindset was hard for me to get used to. As trainees in the U.S., we are expected to know everything about each patient—their exams, their labs, their medications—at all times. Every move we make is intended to fight decline and death. We pour IV fluids, blood transfusions, and potent medications into patients' veins. We use expensive, invasive equipment to monitor our progress. And we dedicate as much time and effort as it takes to battle illness or repair injury. Some-





Above, an intern finishes closing the hippopotamus bite that Sorensen describes here. Below, a hippo bares its teeth, which can inflict gaping, dirty wounds.

For a WEB EXTRA with a link to a blog Sorensen wrote while she was in Ifakara, plus a gallery with more of her photos, see dartmed.dartmouth.edu/su10/we02.

Meredith Sorensen, the author of this feature, is a 2006 graduate of Dartmouth Medical School and a current resident in general surgery at Dartmouth-Hitchcock Medical Center (as well as a member of the Dartmouth Medicine *Editorial Board). In addition to doing the rotation in Tanzania about which she writes here, she also recently completed a master's degree in science and medical journalism at Boston University. The names of all the patients mentioned here, and identifying details about them, have been changed. All the photographs were taken (with permission from those pictured) by Sorensen or her colleagues in Tanzania.*

These are three of the interns at Saint Francis; interns there care for as many as 90 patients each.

In the U.S. this would have been an emergency. But as we examined our bleeding patient in the ICU, the surgeon simply shook his head and said, "This is when we say *'Pole.'" Pole*, pronounced po-lay, is a Swahili word that means "I'm sorry."

times we win, sometimes we don't. But in Tanzania, partly because resources are so limited and partly because medical education and clinical decision-making are so different, death seems to have the upper hand.

One morning, for example, the surgical team was called to see a patient in the ICU, a 47-year-old man who had been admitted the night before because he was vomiting blood. We found the patient writhing on his bed, muttering nonsensically and moaning. He was unable to answer questions, but according to his admission note he had no history of gastrointestinal bleeding. Closer review of the chart revealed a single reference to liver cirrhosis—a condition that can make patients prone to bleeding from abnormal veins, called varices, in their esophagus.

Fluids were dripping slowly from a glass bottle suspended above his bed into a single small IV port in his arm, and a catheter had been placed to drain his urine. He had received two units of blood overnight, but there were no lab values to show the effect of the transfusion. And he had received a dose of furosemide, a diuretic, to "help" him get rid of extra fluid. The problem was this patient had no extra fluid to give. In fact, he was dangerously dehydrated and presumably still bleeding. His blood pressure had been checked a few hours earlier and logged at a low 100/70.

In the U.S., this would have been a major emergency from the instant the patient arrived. But as we examined our bleeding patient in the ICU, the surgeon simply shook his head and said, "This is when we say '*Pole*.'" *Pole*, pronounced po-lay, is a Swahili word that means "I'm sorry." I walked through the ICU a few more times that day, but the language barrier made it impossible for me to get accurate updates from the nurses. The patient was still unable to communicate. His chart was incomplete and no vital signs had been recorded. With a mixture of frustration, guilt, and vincibility, I realized there was nothing I could do.

The team did not check on the patient again until rounds the next morning. By then, he had deteriorated further. He was lying inert on the bed, every labored breath rattling in his chest. His eyes were open and unblinking. He did not respond at all as we examined him. A nasogastric tube—a plastic tube running through one nostril and down into his stomach—was now in place, but it was capped so it could not drain the blood that was accumulating in his stomach. No IV bottle hung above his bed. The bag attached to his urinary catheter contained almost no urine, a sign of severe dehydration. No one was sure when it had last been emptied. His most recently recorded blood pressure was 80/40—a sure sign that he was still bleeding.

In the U.S., the resident on call would have hovered by his bedside all night, working with the nurses to monitor his condition, make adjustments to his medications, and update his family. Here, I learned, no one had even been notified. The on-call interns admit new patients and certify deaths but otherwise have very little to do with minute-to-minute patient care.

The attending surgeon who was leading rounds that morning pointed out to the interns a few of the mistakes that had been made in this patient's case, explaining a bit about low blood volume. He was irritated that the patient had not been receiving fluids, but his reaction was quite mild. An attending in the U.S. would have issued a severe reprimand for such an oversight. In a too-little, too-late effort, one of the interns removed the cap from the nasogastric tube. There was no suction pump available, nor any premade drainage bags, so he fashioned one out of a latex glove. Almost immediately, the glove filled with blood from the patient's stomach. The intern attached another glove, and it too filled rapidly.

I have never felt so helpless. I would have felt confident managing such a situation at home, but what could I offer under these circumstances to this critically ill patient? Saint Francis does have an endoscope, but there is no way there to stop internal bleeding even if the offending vessel can be located. There was no more blood in the blood bank (simply a small refrigerator in the corner of the lab), so there was no way to give the patient another transfusion. He had been so dehydrated for so long that his kidneys had likely already failed. There were no ventilators at Saint Francis, so he would continue to struggle to breathe. And because of the scarcity of medications, sedatives and narcotic pain relievers are never used to keep terminally ill patients comfortable. I desperately wanted to do *something* to help this patient, but what?

One of the visiting medical students from New Zealand suggested that we at least tape his unblinking eyes shut. Otherwise they would dry out, and, if by some miracle he recovered, his vision could be damaged. So the student and I found some tape and gently tacked the patient's eyelids down. It wasn't much, but at least we were trying to help. The Tanzanian interns and nurses laughed at us. Even after we explained our thinking, they continued to laugh. The concept of comfort care, no matter how basic, is not a priority in rural Tanzania.

That evening, the patient died. The intern on call simply said, "It was his destiny."

I remembered with chagrin complaining once about covering 20-some patients during an especially busy time when I was an intern on the trauma service at Dartmouth-Hitchcock. That was nothing, I now realized. Not only did the Tanzanian interns routinely carry rosters of as many as 90 patients, but they had no senior residents to call on for advice, and their attendings were often absent. Furthermore, internet access is unreliable in Ifakara, and the most recent surgical textbook in the Saint Francis library bore a publication date of 1984. No wonder the interns were constantly uneasy about taking on new patients.

A case in point was the day I came upon an argument. It was being conducted in Swahili, but I was able to discern the gist of it: the pediatrician thought the surgeons should admit a patient, and vice versa. *A fairly standard hospital turf war*, I thought, until the surgical intern said, in emphatic English, "Cholecystitis is not a surgical problem!" There were two problems with that statement: first, it would be highly unusual for an otherwise healthy nine-year-old to have cholecystitis, or inflammation of the gallbladder, and second, cholecystitis definitely can be a surgical problem. It sounded like a valid consultation to me.

The thin little girl who was the subject of the discussion was lying perfectly still on a bench, under a pile of kangas—brightly colored pieces of fabric that are the traditional garment for women in Tanzania. She whimpered weakly as her mother lift-

Above, this nine-year-old turned out to have a perforated intestine rather than cholecystitis. Below is Sister Immaculata, a nurse, with one of her assistants.

Jana, the girl who was hit by a car, strikes a Batman pose to go with the sticker on her forehead.

The surgeon drilled a few holes in the left side of Jana's skull until he found the pool of blood that was pressing on her brain. He drilled two more holes and allowed the blood to drain until it stopped. Then he transferred her to the ICU and waited.

ed her onto the "exam table," a crib mattress on the counter of the pediatric reception area. She winced upon even the lightest push on her abdomen, which was impressively distended. She had a fever, her heart rate was too high, and she was breathing too fast. An ultrasound had been done, but the actual images are not available to clinicians—only an index card with an interpretation scrawled on it, in this case a single word: "cholecystitis." She'd had only one lab test—a measure of her red blood cell count—and the result suggested she was not anemic. The surgery interns grudgingly admitted the girl and started some antibiotics and IV fluids.

No one checked on her again until the next morning, when the intern found her feeling much worse. Her pain was more intense and her fever even higher. An x-ray showed a clear chest but a white-out below her diaphragm—a difficult finding to interpret. This time, her white blood cell count was checked; it was elevated. I examined her again. She now had classic rebound tenderness—an exam finding that in the United States would trigger an immediate trip to the operating room. Instead, the intern said they were thinking about doing an exploratory laparotomy around 3:00 p.m.—"African time," meaning even later. By this point, the girl had been symptomatic for almost 48 hours.

As the intern and I walked to the operating theatre around 4:30 that afternoon, he said matter-of-factly, "You know, most of our pediatric emergencies die." He was very surprised when I told him that children rarely die after surgery in the U.S. "Maybe it's because we wait," he said. "The books all say it is, but an acute abdomen is not an emergency in Africa."

There are many reasons for the slow response to situations we deem emergencies. Many parents try homeopathic remedies first; other obligations often prevent families from bringing their children to the hospital right away; and even once they've left home, patients must often travel great distances to get to Saint Francis. But once patients arrive at Saint Francis, the delays were harder for me to understand. Was it a resource problem, or a knowledge deficit, or simply a matter of my being used to the immediacy of the American system?

By the time the girl was wheeled into the operating theatre, her appearance had deteriorated markedly. She lay curled up on her right side, not moving at all, moaning, sweating, and breathing very fast. She did not speak, but her sunken eyes were pleading. Her belly now looked like a fully inflated balloon.

Thankfully, one of the attending surgeons was there, since neither the intern nor I was qualified to do the operation independently. As soon as he made an incision down the middle of the girl's abdomen, large amounts of cloudy fluid gushed out. Her gallbladder looked normal, but her small intestine was red and swollen along its entire length. The precise problem was not immediately obvious. Finally, we found it—a small perforation in the duodenum (the first portion of the small intestine), just past where it leaves the stomach. The attending repaired the hole, wiped off the rest of the bowel with damp gauze, and closed the incision.

That night, the patient's mother sat by her daughter's bed. They held hands under the mosquito net as the little girl slept. My elementary Swahili prevented me from adequately expressing my sympathy or asking how the girl was doing. Once again, I felt helpless. Especially in such circumstances, words can be a doctor's most powerful tools.

But despite my doubts, the little girl's story had a happy ending. Two days later, she was transferred from the ICU to the pediatric ward and continued to do very well. There, she joined some of the greatest success stories at Saint Francis.

She met Jana, who had been hit by a car and suffered multiple serious injuries. Both of Jana's femurs had been broken, and her legs remained in traction—with heavy sandbags dangling off the end of her bed, attached to her shins with tape and twine. If not for her slightly dilated left pupil, you would never have guessed she had also suffered a serious head injury. The interns told me that when she'd arrived at the hospital after her accident a few weeks earlier, she had been completely unresponsive. Her left pupil was "blown," a sign of elevated pressure inside her skull. Without a CT scanner, the Tanzanian doctors must rely totally on physical signs to determine the source of such a problem. And with no subspecialists like neurosurgeons or orthopaedic surgeons, the general surgeons truly are general. Based on Jana's exam, the surgeon drilled a few holes in the left side of her skull until he found the pool of blood that was pressing on her brain. He drilled two more holes and allowed the blood to drain until it stopped. Then the doctors transferred her to the ICU and waited. There was no ventilator, no intracranial pressure monitor, no way to continuously measure her blood pressure. So they simply waited and hoped. And a few days later, Jana woke up essentially back to normal.

Every morning when we came in for rounds, she would squirm and bounce around on her bed. If it hadn't been for her traction, I think she would have run out the door. Giggling, she'd point at me and shout, "*Mzungu, Mzungu!*" A Swahili word that derives from the word for "traveler," *mzungu* is the term applied to all white people. In rural places like Ifakara, *wazungu* (the plural form) are relatively rare and fascinate children. Jana loved to touch my skin and pet my blonde hair, which would usually set off another giggling fit. Whenever I found myself frustrated by the lack of resources at Saint Francis, Jana's incredible recovery reminded me how much the Tanzanian physicians do with so little.

Above is Sorensen with Safi, the 11-year-old with the badly broken arm. Below are two other pediatric patients, sharing a bed; even adults must sometimes double up.

The day before I'd arrived in Ifakara, there had been another collision, between a car and a child on a bike. Eleven-year-old Safi was mostly okay. Unfortunately, his "only" injury was a badly broken right arm. Both bones in his forearm had splintered into several pieces, and he had a large overlying open wound. The interns told me the boy had been brought to the minor operating theatre and only lightly sedated while they operated. Two interns and a medical student from New Zealand had tried to fix Safi's fractures. They were afraid to call the attending for help, so that day they ended up just washing out the wounds and trying to wire a few of the pieces of bone back together.

The next day, the attending used stainless steel pins to fix the fractures more securely, but the wound had to be left open. Every other day for the rest of my time in Ifakara, Safi came to the minor operating theatre for a wound washout and a dressing change. The first time, Sister Immaculata tried to place an IV so we could give Safi some sedation. She poked his arms, his hands, and his feet over

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and over without finding a vein. He started to cry. Then one of the interns tried, also without success. With each needle stick, Safi got more upset, sobbing and begging them to stop. If it meant he did not have to have an IV, he said, he wanted the procedure done without anesthesia. So we took off his dressings, exposing bone and wire and damaged tendons. The brave little boy hardly flinched. As the interns washed his wound, he occasionally glanced toward it.

With each subsequent trip, Safi got a little more curious until finally he was watching the entire procedure. Even when we had to snip away at his blackening tendons, hoping to get rid of the necrotic tissue but still preserve some function, he watched. Even when we had to use a sharp curette to roughen up the wound base until it bled, in an effort to stimulate the growth of healing granulation tissue, he watched.

Although I spoke minimal Swahili and Safi spoke no English, we became friends. He loved the Superman and Batman stickers I gave him and stuck one to his forehead after every trip to the operating theatre.

On my last day at Saint Francis, I asked one of the interns to tell him I was about to go back to America. At first he frowned, but then his face lit up again with his characteristic grin. He started chattering excitedly in Swahili. Everyone in the room smiled, and Sister Immaculata said, "He wants to tell you that he's going to be a doctor someday. Maybe he will meet you again."

Now it was my turn to tear up. I knew the outcome of Safi's injury would have been very different in the United States. His fractures would have been fixed more evenly, his wound would have been cared for with more sophisticated dressings, his tendons might not have died. Yet despite all he had been through, Safi was inspired by the experience.

I now realize that we sometimes get lost amidst all our beeping monitors, plastic tubes, computerized scanners, sophisticated diagnostic tests, potent drugs, and invasive therapies. My trip to Ifakara was just what I needed to remind me that medicine is—regardless of the resources that are at hand—ultimately about helping people. ■