An Exemplary Nutrition Program Scalable in Low and Middle Income Countries

As the sun comes up over the verdant hills behind the hospital, I follow my colleague through the hallway between the wards. The hall is open on the sides but covered against the afternoon showers of the rainy season. We pass the outpatient department where people are already beginning to gather, clutching the small pink notebooks they bring from home that serve as their ongoing medical records. The admissions office is next. A patient is lying on a gurney in the hall, waiting for his wife to pay the admission fee and sign him in. We pass the lab and pharmacy where others sit on low stone walls waiting for services. Finally, our destination for initial morning rounds - the pediatric ward.

The woman I am following sports a white lab coat with a green band attached to the seams in the back and another rimming the front pocket. On the pocket is embroidered the word "Nutritionist." We enter the antechamber of the ward where she is greeted warmly by the ward nurse and several ancillary staff. A rusty floor scale sits near the door along with an oxygen extractor. A young patient is sitting on her mother's lap, screaming as a nurse tries to take her temperature. There is a large register book on the peeling green desk that serves as a work station for all the ward staff. Men and women in a variety of uniforms crowd behind the desk, standing or sitting in metal chairs while recording vital signs on brown clip boards or reading lab reports. We consult the register to find patients admitted during the night and proceed into the brightly lit ward.

There are 22 beds in the ward, each with a mosquito net hanging above it. The distance between each bed is about 2 feet, more generous than in the adult wards, and someone has painted murals depicting Bible stories on the lemon-colored walls. Each bed is numbered and we visit the new patient in bed 3. The 6-week-old baby is dehydrated, appearing like a small shriveled monkey, but when we give him our fingers, he grasps them so strongly we can lift his head and shoulders off the bed. Mabelle, the nutritionist, and I suspect his mother has suddenly stopped feeding him. Mabelle questions the mother, then asks her to put the baby to her right breast. While baby is suckling, Mabelle hand expresses milk

from the other breast — something I would not have thought of. Milk flows freely into a cup, proof that the mother is producing plenty. Further questioning in pidgin English, the language of this part of Cameroon, reveals that the baby's father has left and the mother is no longer interested in taking care of "his" baby. Mabelle reports this to the nurses and makes a note in the clipboard chart which hangs on the end of the bed. She encourages mom to nurse the baby and grandmother, who is looking on, seems interested in making sure this will happen.

Next, we visit bed number 11. This two-year-old girl has been almost a month in the ward. Her ailment has stymied the physicians and she continues to decline despite multiple diagnostic lab draws, tuberculosis and HIV tests, and multiple courses of antibiotics. Her worried mother, who is completely committed to doing whatever the doctors suggest, holds a large plastic syringe filled with baby formula that is dripping into a tube inserted into the child's nose. At night, the mother sleeps on a mat under the girl's bed in order to be quickly and constantly available. I explain to Mabelle the potential benefit of probiotics for a child who has endured multiple courses of antibiotics and the possibility that the girl's immune system is severely compromised by malnutrition. We provide yogurt to the mother and encourage her to feed it to the child by spoon. We write a chart note suggesting liquid multivitamins be added to the formula.

We check on other little ones in pediatrics, then walk outside a short distance to the men's ward. Another hospital nutritionist is there making rounds with my husband, a family practice physician. Because of the need for his specialty here at Mbingo Baptist Hospital, my husband and I have come to Cameroon to serve with World Medical Mission (WMM) https://www.samaritanspurse.org/what-we-do/world-medical-mission-2/ , an organization that supplies volunteer doctors and other medical professionals for short terms of service to Christian mission hospitals around the world. These providers are placed in hospitals and clinic in more than 25 countries as needed to teach indigenous physicians and to help fill gaps in care. This is our fifth term of service with WMM and second at Mbingo Hospital.

We have come back again for three months, partly because of the presence of nutritionists at the hospital, which provides an avenue of service for me as a Registered Dietitian that is uncommon in Africa, where we often serve.

The Nutrition Improvement Program (NIP) at Mbingo Baptist Hospital grew out of a grant the hospital received from the Elizabeth Glaser Pediatric AIDS http://www.pedaids.org/ Foundation for a program to prevent the transmission of HIV from pregnant mothers to their babies. This form of transmission had, unfortunately, grown increasingly common in Northwest Cameroon. Prevention of mother to child transmission (PMCTC) is fought with HIV testing, counseling, and anti-retroviral drugs. PMCTC program staff soon recognized nutrition as a factor in the mothers' response to anti-retroviral drugs and became aware that many attending the program were undernourished.

A local man with a nursing degree and a master's degree in health administration, Godlove Nkouh, was hired to begin a nutrition program. Because AIDS grant money was being utilized, any staff hired to tackle nutrition issues would also need to be trained in HIV counseling. Thus began a program to hire and educate women in nutrition basics and HIV counseling. Mr. Nkouh wrote curriculum for a three-month course, hired six high school graduates who could read and write English and put them through the course in early 2007. These women became the nutritionists for the PMCTC program, working with pregnant women to educate them on the importance of good nutrition for themselves and their babies, and employing resources available to help them purchase nutritious food.

Soon, the nutritionists were being called upon to teach hospital inpatients and outpatients better nutritional habits as the value of their services became obvious in the PMCTC program. Nkouh was encouraged to train more nutritionists and to make them available to outlying clinics using added funds from the hospital's resources. An American with a Ph.D. in public health nutrition who was working for an international non-governmental organization in a nearby town, became involved in reviewing

curriculum for the program, now dubbed the Nutrition Improvement Program http://cbchb-cm.org/html/nip.html

Doctors and nurses in the hospital began calling the nutritionists for consults, so a nutrition internship was established whereby the students served three months under the tutelage of an established nutritionist after their classroom coursework was completed. By the time I first encountered the program in 2013, nutritionists were employed in three of the five hospitals and 21 of the 26 clinics under the administration of the Cameroon Baptist Convention Health Board (CBCHB). I found it to be a well-run program, conceived of and administered by Africans.

I believe the Nutrition Improvement Program could be replicated in hospitals and clinic systems in low and middle income countries if seed grants for training can be found, or if ministries of health recognize the program's value and are willing to support. The CBCHB currently adds a minimal charge to patients' bill when they receive services from the nutritionists which pays salaries for NIP employees no longer exclusively working with the PMTCT program. A similar scheme to support the program long term would be necessary wherever it is implemented. Mr. Nkouh has overseen the writing of a nutrition training manual and a handbook on infant and young child feeding which could be revised for use in other countries.

Originally, completion of college coursework was not required to attend nutritionist training, but now incoming students have an associate's degree or higher in a nutrition-related field. Thus, the nutritionists are excellent at the basic application of rote dietary advice for a variety of the major non-communicable diseases and for malnutrition. Most lack education, however, in subjects such as biology, anatomy, and physiology which contribute to the understanding of pathophysiology. Part of my role in our two terms of service at Mbingo Baptist Hospital was to increase the nutritionists' knowledge of therapeutics, anatomy, and the underlying pathophysiology of disease. Besides providing once per week didactic sessions, rounding with each of the five nutritionists allowed me to teach at the bedside.

In the surgical ward, I introduced them to new possibilities for care of patients post-operatively, including those with head and neck cancers and various GI resections. We also discussed the importance of a patient being in good nutritional status prior to surgery when possible. In the internal medicine ward, we collaborated on new ideas for nutritional care of AIDS patients in various stages of decline. In the pediatric ward, we introduced the use of Plumpy Nut and criteria to determine which patients would benefit. As these nutritionists are transferred to other hospitals in the region and teach nutrition trainees, these new ideas will be disseminated beyond Mbingo Hospital.

Mabelle brought to my attention that though tube feedings were often needed, and the doctors wanted to prescribe them, the nurses were resistant because use of powdered milk-based formulas not infrequently led to patient incontinence of watery diarrhea. As a group, we discussed lactose intolerance and the need for a nonmilk-based formula. We found a supplier of soy powder and visited the small factory to check on cleanliness and consistency. I had the powder checked by a lab in Oregon to verify protein content, we added oil and sugar plus vitamin powder, and figured out how to combine it into a lump-free tube feeding. After lessons on calculating calories, the nutritionists and I came up with recipes for regular and super calorie/protein formulas, six in all, each of which we named so the doctors knew how to order them.

A protocol for providing formula twice per day to patients was enacted so formulas would not sit by patient bedsides longer than 8 hours — it had been 24 hours at times in the past! Now, on rounds the nutritionists would routinely check for leftover formula and could calculate calorie and protein intake for the day.

As we continue on rounds on the day described above, Mabelle and I visit the new intensive care unit. Our patient in the ICU has been in a coma and unable to eat because of an infection in his brain. Without the newly initiated tube feedings we provided, he would have had no nutrition for several weeks. When we reach his bedside, we find him awake, moving his hands, and trying to smile. Success!

It has been my joy to participate in and add to multiple other small projects for the NIP. A group of my friends and colleagues who are RDNs have been faithful financial supporters of projects I have initiated at Mbingo. They have donated money for manual breast pumps for the obstetrics ward, 20 locally-made infant measuring boards with which I was able to emphasize the need for measuring the length of babies in hospitals and clinics to detect stunting, and vitamins for the pediatric ward.

Since our last visit in 2015, the political situation in the northwest region of Cameroon has deteriorated nearly to the point of civil war, so Mark and I have been unable to return. Instead, I have been involved from my home in Oregon in projects benefiting the NIP. I have consulted on updates to the hospital portion of the NIP course curriculum in collaboration with dietetic interns in Colorado and their internship director, who was able to go to Cameroon to teach that portion of the course. Mr. Nkouh and I wrote a grant for vitamins for pregnant women and children attending the outpatient department that was renewed several years. I was able to link the excellent and passionate diabetes nurse at the hospital who collaborates with the NIP to an intensive online diabetes course and provide him a scholarship to enroll. He is able to add to the nutritionists' knowledge of diabetes care.

Our long-term plan is to return to Mbingo Hospital with World Medical Mission when peace and order return. At that time, I plan to work with the NIP to address poor wound healing, undoubtedly linked to poor nutrition, which leaves patients of all ages lingering in the hospital "wound" ward for up to nine months and often requiring repeated admissions.

If the Nutrition Improvement Project is chosen for the Wimpfheimer-Guggenheim award, the proceeds will be used to set up a trial to determine if provision of vitamins, minerals, and high protein foods will shorten time to discharge. With these additions to the tool box of the Nutrition Improvement Program at Mbingo Hospital, nutritionist rounds will likely observe even more successes!

For more information about the Nutrition Improvement Program, you may contact me, Laurie Sauerwein, MS, MScPH, RD at lsauerwein.nutritionist@gmail.com