

A Day in the Life of Mark J. Manary, MD

Helene B. Roberson Professor of Pediatrics
at Washington University in St. Louis, MO, USA

Sight and Life (SAL): *Mark Manary, you are a medical doctor by training and also Professor of Pediatrics at Washington University in St. Louis. What inspired you to study medicine when you were younger?*

Mark Manary (MM): I've always been a couple of standard deviations out there on wanting to make the world a better place! I originally studied chemical engineering at MIT, and my first job was at an aluminum company. The company was planning to lay people off, however, and just at that time I got a call from somebody at Washington University asking if I might consider studying medicine there. The university was looking to boost numbers on its medicine course, and prospects at the aluminum company weren't particularly appealing, and so I decided to give it a try. It was a leap in the dark, because I'd never really studied biology, but I'm a person who is very focused on the present, and I tend to think more about what I'm doing in the here and now than what I might be doing in five or 10 years' time. So I took the opportunity.

It was incredibly hard at the beginning, and I got substandard grades for my didactic work, but I stuck with it because I found it so fascinating and rewarding. Seven years later, I was working in pediatrics, and I moved on from that to become a food producer in Africa, which hadn't been planned at all, of course. I'm a generalist by nature, and I like to think that I can put my mind to anything if I really want to.

SAL: *What drives your especial interest in pediatrics?*

MM: It comes from the choices I had to make while at medical school. The first couple of years of my studies were very challenging, not least because I had to work alongside people who had an entirely different background and mindset from my own,

but by the third year I was working in a hospital. Eventually I had to decide on an area of specialization. I was aware that I lacked the deftness to be a surgeon, but it struck me that if children are ill and receive appropriate treatment, then they have a very good chance of getting better. This appealed to me because I wanted to make a positive difference in people's lives.

So I spent two years in pediatrics, after which my wife Mardi, who is a registered nurse, suggested that we go to Africa – which was quite an unusual decision to make in that day. By 1985, I was working in a mission hospital in Tanzania, and the HIV epidemic was under way. I was the only doctor in a 400-bed hospital, and I dealt with over 300 surgery cases in my first year there – by which I mean that I did the actual surgery!

It was a very different era from today, of course. We kept the hospital running with the aid of medical students from the US and the UK, and my wife and I fell completely in love with Africa. For us, it was a place where we could make a life-or-death difference through minor surgery and the administration of drugs such as antibiotics and antimalarials. It was a hugely rewarding experience for us both.

SAL: *And so did you stay in Africa from that point on?*

MM: No, we returned to the US for some years. My wife and I had a son in Africa, but he tragically suffered cot death. This had enormous ramifications not just for the two of us, but for our respective families as well. Mardi and I therefore felt it would be appropriate to move back to the US.

I spent two years on the Cheyenne Indian Reservation in South Dakota as acting Clinical Director with the U.S. Public Health Service. There were many health and societal problems to address on the reservation, but the Native American population was mistrustful of the Public Health Service, and I found this a very difficult experience. Africa had been very different, for people there had reacted so positively to our attempts to help them. Mardi then became pregnant again, and in 1989 I moved back to Washington University as an emergency doctor. We both



Dr. Mark Manary

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Evaluation of a child with severe malnutrition at the Chikweo clinic in Machinga, Malawi

felt so passionate about Africa, however, that we arranged to get sent back out there, moving permanently to Malawi in 1994 to work in a new government medical school.

SAL: *How did you become involved in nutrition, and specifically in the development of the first ready-to-use therapeutic food (RUTF)?*

MM: I've always believed that if you want to have a positive influence on the world, you should try to work on the biggest problem you can find: it's better to chip away at a really big iceberg than to spend your whole life looking for a little bit of thin ice that you can melt. Levels of malnutrition were very high in Malawi in the 1990s. I was actually advised by my boss at the time to steer clear of nutrition because it was "just too grim," but Mardi and I are willing to take challenges, and we felt we had to do something in the face of the suffering we were witnessing.

So we took on the biggest problem: pediatric severe acute malnutrition (SAM). At the time, one in three children diagnosed with malnutrition in Malawi was dying despite our best efforts to treat them. After about eight months, we got that figure down to one in ten, but just one in four recovered. That meant that there were still significant numbers of children dying, however, and that the milk-based nutrition they were being offered was

clearly not adequate. We felt that a new approach was necessary – some form of home-based therapy that would allow us to break through that "ceiling" on recovery.

SAL: *So how did the breakthrough come about?*

MM: We were working on a different project involving zinc nutrition at the time, in a small village where simply getting through



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Children being measured to determine nutritional status in Chipalonga, Malawi

the day involved a huge amount of manual labor for the locals, starting with drawing water and collecting firewood for cooking. It was clear to us that any ready-to-use therapeutic food would have to fulfill four criteria if it were to be effective in this context. It had to be edible without needing to be cooked, it had to provide adequate levels of protein and fats, it had to be stable in hot conditions, and it had to be resistant to the growth of bacteria on it.

Shortly after the zinc project in that village came to an end, I happened to get an email from a French colleague, the pediatric nutritionist André Briend, who was interested in the subject of therapeutic food and wanted to compare notes with me. André had been looking into fortified biscuits and other delivery mechanisms, but I'm an American, and so my thoughts went naturally to peanut butter: it sits on the shelf for ages without going off, because 50% of its content is fat. The oil won't allow bacteria to grow, even in warm conditions. It's therefore ideal for use in a hot country such as Malawi.

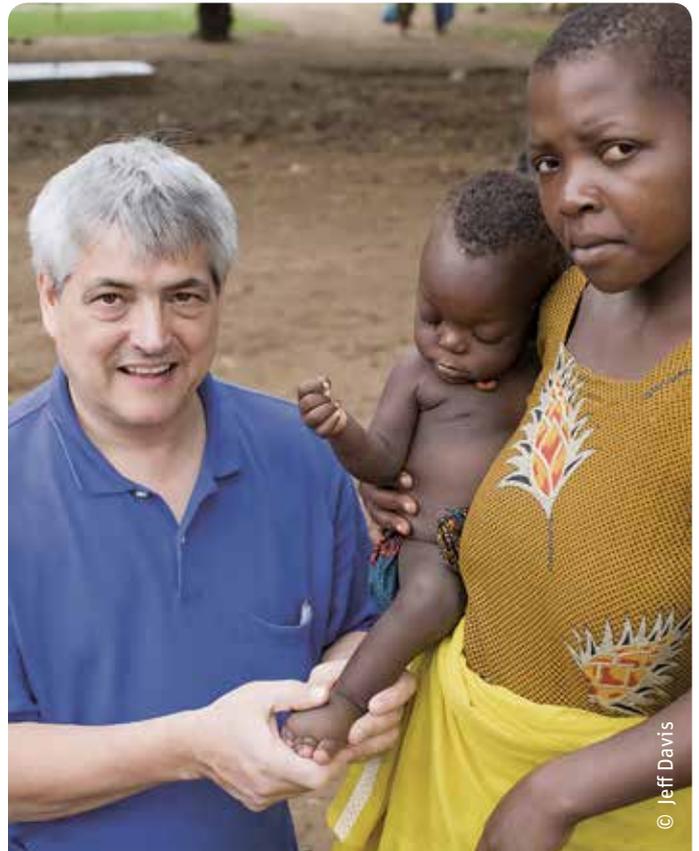
With the help of the French company Nutriset, which had been founded in 1986 to feed vulnerable populations in developing countries and provide humanitarian workers with effective nutritional products, we developed the first RUTF, which was based on peanut paste, milk powder, vegetable oil and sugar. The results from the initial clinical trials were very positive, and so we decided to take the leap and manufacture it locally.

SAL: *What were the challenges in making that happen?*

MM: There was a challenge at the level of nutrition policy, for the World Health Organization was initially against ready-to-use therapeutic foods. On the ground in Malawi, however, it was clear that although our initial attempts at local manufacture were promising, we lacked the local capabilities to manufacture at the scale necessary. Fortunately, we managed to obtain the financial support of humanitarian donors, which enabled us to set up the NGO Project Peanut Butter in 2004. Nutriset was also extremely supportive, supplying us with the necessary manufacturing machinery and also training a Malawian as factory manager. This allowed us to significantly scale up our output, after which agencies such as WHO, UNICEF and WFP came on board, providing another much-needed boost to our efforts.

SAL: *Much of your work has focused on combating malnutrition in children. Based on your experience, do you think that the UN Sustainable Development Goal of Zero Hunger is practicable?*

MM: I do. I'm convinced that we can beat hunger. It's just about food. We've halved levels of malnutrition in the past 15 years. The government of Malawi endorsed homemade therapy in 2007 and put in place local health workers to promote its use. These



Mark Manary: "It's about connecting with mothers"

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efforts have cut the rate of infant mortality from malnutrition from 23% to 6%, even though Malawi remains one of the poorest countries in the world, with most of its population dependent on subsistence farming.

SAL: *You've gone on record as saying, "In situations of chronic poverty, you're definitely going to get more mileage out of something you can embed in the local fabric." What does embedding in the local fabric mean in this context?*

MM: It's about connecting with mothers. You have to get right to the people who need the help. Village health workers have an important role to play here, because they have valuable local knowledge and are held accountable for their actions by the entire village where they live. This is not the case with health workers, who don't have the same kind of local accountability and may be open to corruption. It's important to manufacture locally and deliver to mothers via the minimum number of intermediaries. In Ghana, for instance, we manufacture RUTF locally and deliver it to local retailers. These retailers want to get paid. The mothers want the food the retailers produce, and so they pay the retailers for the food they receive. Cutting out the warehouses and middlemen means that the RUTF gets to the people who really need it. That's what I mean by "embedding in the local fabric."

SAL: *RUTFs are still a relatively new public health intervention. Are there ways in which they could be improved?*

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MM: We've developed linear programming tools that allow us to replace some of the original ingredients with locally produced foods, reducing costs at the same time. We're currently looking at changing the balance of polyunsaturated fatty acids (decreasing the omega-6 content and increasing the omega-3 content) and are also exploring the potential use of other oils, such as high oleic soy oil.

We also need to improve the quality of the protein content of RUTFs and to find ways of replacing the stabilizers and emulsifiers currently in use. It's been found that these can dissolve the mucus layer of the gut, providing harmful bacteria with easier conditions in which to attack the body. We're therefore currently looking into the use of whey-based emulsifiers as an alternative.

SAL: *You have received many awards and distinctions, from the CIBA Award of Community Service that you received in 1980 to your appointment to the WHO Expert Advisory panel on the Management of Malnutrition in Children in 2012. Is there one of these recognitions that gives you especial pride, and if so, which one and why?*

MM: I'm very honored by all the commendations I have been lucky enough to receive, but the two that mean the most to me come from General Mills and Hershey, both of which provide financial support to Project Peanut Butter. The fact that these commercial organizations wanted to help food producers in Africa, and that they've been able to do it via Project Peanut Butter, is hugely important to me.

SAL: *What would be your advice to aspiring pediatricians reading this article, Mark?*

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MM: I would counsel anyone interested in pediatrics to be an empiricist rather than a philosopher. By this I mean that if you want to bring about positive change, it's essential to try things out, find out what happens, and believe in the result. Base your work on realities rather than ideas. And always, always, go after a really big problem.

SAL: *Thank you, and the best of luck with all your future projects*

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MM: Thank you.

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Mark Manary was interviewed by Jonathan Steffen