Child Nutrition

Anita Zelaya-Youngberg, RN BSN—Pan American Health Service, Inc.

In keeping with the objective of this book to provide tools with which every home may be a place of healing and every house of prayer a place of loving care, Anita Zelaya-Youngberg describes the work of the Pan American Health ministry as it applies to malnourished and hurting children. Though presented from the perspective of the remote mountain areas of Honduras, the principles discussed here are applicable with but slight modification anywhere in the world. As such, this ministry serves as a model for others, who seeing a need, are inspired to move out in faith and make a difference in our world.

Widely varied populations from around the world have been engaged in the war against hunger for generations. No civilization has been immune to the problem. Some choose to fight the battle. Others choose to ignore it. And sadly, millions succumb to the struggle each year—dying without really knowing what it feels like not to be hungry. Happily, some have successfully won the battle against hunger and have gone on to live productive lives.

What is it that determines success in battling this world-wide enemy of good health and of proper growth and development? "Hunger is a problem so big that no government in the world can solve it," Dr. Stephen Youngberg once stated. "It takes individuals such as you and me to look around and see how we can make a difference. You know… 'If every man would mend a man, the whole world would be mended'."

Taking this approach to making a difference one person at a time has been one of the keys to the success of Pan American Health Service, Inc. (PAHS), a non-profit organization that operates a health and educational outreach from their campus in the mountains of north western Honduras. Situated near Lake Yojoa, on the outskirts of the town of Peña Blanca, the PAHS campus is surrounded with lush greenery and the constant warble of birds. This unique ministry was started by a physician, Dr. Stephen Youngberg and his wife Verlene, a registered
nurse, and organized into a legal entity by Texas businessman Walter Tynes in 1959. Dr. Youngberg and Verlene, moved their family to the Lake Yojoa region in November of 1960 hardly dreaming that the nature of their ministry eventually would take on the very basic problem of hunger.

Based on his experience with poverty medicine in Mexico, Dr. Youngberg expected to find a problem with tuberculosis. To his surprise he found that childhood malnutrition was the single most preventable life-threatening illness he encountered in the first few years of seeing patients in his primitive jungle clinic.

Here is his personal account of how he got his own start in the fight against hunger: “During clinic one day I was seeing a young boy who was malnourished. I told his mother she needed to feed him eggs, beans and cheese and give him milk. She sadly looked back at me and said: ‘But Doctor if I could feed him those things he would not be sick.’ Clearly it was beyond her means to provide this child with the proper nutrition. This gave me the idea that I could take children in my hospital as in-patients to feed them a balanced diet and give them medical care until they recovered.”

From a humble start in an army tent that doubled as a Hospital ward, the Youngberg mission has grown into what is now known as the Pan American Health Service, Inc. composed of a Nutritional Rehab, a Home for abandoned Nutrition Hospital patients, a farm, an outpatient clinic for the poorest of the poor, and an elementary and vocational school targeted to people with limited resources.

Chapter contents

A) The need for nutritional rehabilitation

B) Overview of nutrition program

C) Essential nutrients
Chapter 4 - Child Nutrition

D) The environment of rehabilitation

E) Medical support

F) Preventing malnutrition among the poor

G) Follow up care to prevent relapse.

A) The need for nutritional rehabilitation—Miguel’s Illness (a true story)

Miguel was 8 years old and had an infectious grin and sparkling eyes. His feet, legs, hands, belly, and face were very swollen. His father had brought him to the Nutrition Hospital, explaining that he had left a wife and seven other children at home—a long distance back in the mountains of Meambar. This father worked the soil to grow food for his family. He and the boy’s mother had noticed that Miguel had been growing paler and more swollen for the last few weeks. They had wanted to bring him to the Nutrition Hospital, but had no money for the bus fare. The family put a chicken up for sale, but no one in their little town had money to buy the family’s chicken. At last someone passing through bought the bird and handed over the precious cash for the bus fare to the Hospital. It was very nearly too late. Although Miguel had a veracious appetite and an upbeat spirit he stayed at the Nutritional Rehab for only two days and then complications set in because of his dangerously low blood protein levels. He started to bleed from his gums and became more lethargic. He was taken on an hour-long drive to the emergency room at the government hospital in the city. His parents were notified of his deteriorating condition. His mother came to the Nutrition Hospital the next day with her youngest un-weaned twelve month-old girl in her arms. For the next two months mother and son would fight for Miguel’s life. Miguel grew steadily worse; he received blood and plasma transfusions. The skin covering his body turned a blotchy brown and then started cracking and oozing serous fluid. He grew so weak that he was unable to turn himself in bed. And yet, through it all he remained upbeat. This was likely due to the influence of his also cheerful and brave mother. When asked, “How are you?” Miguel would chirp a cheerful, “Bien!” with a smile. Two months
after entering the acute care hospital, he left to return to the Nutrition Hospital for further nurturing and strengthening. His grateful mother returned home to her other young children whom she had not seen in several months. Meanwhile, Miguel joined the other Nutritional Rehab patients in the daily routine of mealtime, snack time, playtime, naps and nature walks. He was given the freedom to explore his green surroundings and to join the boys his age who lived permanently in the home when he felt like it. He also went to church and learned about a Jesus who loved and cared for him. Miguel was able to rejoin his family six months after leaving them because of his malnutrition. He was still working on growing his hair back, and he had been left with a slight degree of nystagmus (a neurological consequence of severe nutrient deficiency), but he was a happy and helpful little boy who had regained his strength.

1. Problems of extreme poverty

Life is difficult for many families. It is especially difficult when food is scarce and the ability to gather it or buy it is very diminished, whether by poverty, illness, or both. Humble people who work for larger landowners have only the meager wages they are paid with which to buy their family’s food. Otherwise they must survive on what they can grow on the land and what fruits or vegetables grow in the wild around them. Many who are living in extreme poverty do not own farm animals such as chickens, goats, or cows that might provide a source of protein from their eggs or milk.

People who have very limited resources are at risk for being malnourished, and this is especially true when there are children involved.

The types of food they can afford to buy often do not provide adequate nutrition for little growing bodies.

a. Many children

Very often, poor families have many children which they must rear with severely limited resources.
b. Lack of spacing between births

Parents who are struggling to raise children in poverty do not often realize that they could lift some of the burden by spacing the births of their offspring.

c. Lack of basic education/ illiteracy

The lack of basic education contributes to their lack of knowledge that they have a choice when it comes to how often their children are born.

The lack of education and inability to read and write compounds the desperate situation of the very poor. Due to the lack of skills many may not be compensated adequately or fairly if they have the misfortune of laboring for dishonest bosses.

d. Single parenting below the poverty line

Many parents who have the misfortune of trying to raise their multiple children alone find it extremely difficult to keep them healthy while working to provide them with food.

Poor parents need a partner to care for children while the other provides for all of them. Often children who are admitted for nutritional rehabilitation at PAHS come from single parent families. Many times these parents are single not because they choose to be, but because of extreme circumstances such as death, imprisonment, or abandonment by the other parent. The parent who has been left to raise the children alone finds him/herself in a great dilemma: do they leave the children alone at home while they go outside the home to seek to provide, or do they stay home to care for the children and suffer the eventual consequences of not having an income?

Many parents must leave their small children to care for themselves and each other, which sometimes has a tragic outcome. Older children do their best, but they are not equipped with
the capabilities of caring for younger siblings.

e. Alcoholism

A great deal of childhood malnutrition is also linked to the alcoholism of one or both of their parents. The addiction often interferes with the care a parent provides their child, and often children suffer neglect as well as hunger from lack of resources for purchasing or otherwise procuring food.

f. Malnutrition

Without adequate foods to eat, small children are especially vulnerable to becoming malnourished since they are on an accelerated growth curve. Suddenly their little body’s increased demand for nutrients is met with a great scarcity. Then there is not enough nutrition to sustain life adequately, much less to grow and develop properly. Children who have breastfeeding mothers who themselves have very little to eat, and children who have been weaned are especially vulnerable to malnutrition. They have not yet developed the molars needed to properly chew foods in order to get the full benefit from the nutrients contained in what they do eat.

B) Overview of nutrition program

1. Indications for admission

When a child is observed to be experiencing lethargy, appears sullen or pale, or exhibits swelling of the hands, feet, or puffiness around the eyes, or in the cheeks, measures must be taken immediately to get the child to a medical facility for attention. Once a child has fallen into a deeply malnourished state, medical intervention is needed as soon as possible to prevent further deterioration. A child in nutritional crisis is at high risk for poor cognitive (mental) development, as well as for other problems. Therefore it is of utmost importance that a child suspected of developing malnutrition be treated as soon as possible to prevent or limit damage to developing systems.
The most life-threatening complication occurs when a lack of protein in the diet causes a child’s blood protein levels to become dangerously low. This can cause bleeding tendencies, as well as fluid accumulation in the lungs. Both of these problems may lead to death in a matter of hours. Medical attention in a well equipped emergency facility is imperative.

2. Arrival and initial care

Since 1965 the treatment of childhood malnutrition has been the primary focus at the Nutritional Rehabilitation Hospital operated by Pan American Health Service in Pena Blanca, Honduras. A typical patient is from one to five years old, and has been brought in by a family member with first or second-degree malnutrition.

Every child brought in by an anxious parent or family member undergoes a health assessment by a nurse or a physician. They are then admitted for treatment that will last from two to six or more months depending on the severity of malnutrition. For example, a child suffering first-degree malnutrition—beginning to show signs of pallor, a round belly with visible ribs—will generally stay for a minimum of two months. A child experiencing third degree malnutrition is generally kept in treatment for a minimum of six months.

Parents are asked to participate in the rehabilitation process by visiting their children at least every two weeks. This is the only request made of parents or guardians.

Upon arrival, the child is given a general health exam, is weighed and measured, and the health history is recorded. If it is determined that the child’s condition warrants inpatient services, a parental (or guardian) consent is obtained, and the child is admitted. The new patient is then given a bath and changed into clothing matching the other little patients. A caretaker then holds and comforts the child as their parent or guardians say goodbye and make their way back home.

Children admitted to the Nutritional Rehab Hospital are typically very shy. They may be expected to cry a great deal the first few days. Then a transformation begins. They make friends among their fellow patients and are befriended by the older children from the homes who come
in regularly to play with the smaller patients. Slowly they begin to feel at home. They begin to eat the delicious food because they see their friends doing the same. They respond to the kindly caretakers who hug them, sing to them, and take them on walks. When they first arrive, they must be pulled along in the big wagon with a few of the other newer and smaller patients. But when they have regained their strength and they can travel on their own two legs, they are free to run around the green campus and into the orange orchards.

3. Care received

a. Tender loving care

Love is a major motivator for ill and sad children to get well again. Many children come from homes made up of large families. At times it has not been possible to have their parent’s full attention. This is compounded much more by the crisis of not having enough to eat. For most little patients it is the first time they have been in an unfamiliar place without their family. All of these factors lend themselves to a child’s deep sadness in the first few weeks of treatment. Often they are so sad they do not wish to eat even when food is made available. Kind words, warm hugs, and smiles from caretakers and older children, and the companionship of the other small children, all serve to start motivating little patients to eat and to get on their way to feeling well again.

b. Physical activity

Physical activities that take place out in the fresh air do a lot to further strengthen and motivate children recovering from malnutrition. The children at the PAHS NRH are regularly taken out into the green environment for walks, or to a playground where they can give both their limbs and their lungs a good workout.

c. Rest

Recovering children are in need of much sleep. The children at PAHS NRH are allowed to sleep whenever they naturally need to, in addition to the regularly scheduled afternoon naptime. Their
bedtime is 6 pm and they typically sleep until approximately 5:30 am. Ideally, bedtime should be a pleasant and quiet time for the little ones, with hugs and kind words given to each child when tucking them into their little beds.

C) Nutrition

The immediate focus for rehabilitating a malnourished child is proper nutrition. At the PAHS Nutritional Rehab Hospital (NRH), a recovering child is given breakfast, lunch, dinner, and two scheduled snack times.

If admitted in the early stages of malnutrition, they are given foods whenever they wish, in addition to three meals and two snacks. Children in more severely malnourished states must have their meals closely monitored for size and content so as to avoid putting them at risk for a “re-feeding crisis” that would complicate their rehabilitation. The foods offered to these more acutely ill children must be easily digestible, soft foods that are plant based and have an appropriate balance of carbohydrates, proteins, and fats. Whenever possible these children should be under the supervision of an advanced practice health professional as they are at risk for life-threatening electrolyte imbalances.

It is rare that a child will have a big appetite when he/she first arrives. They are unaccustomed to eating often and their appetite seems to have been suppressed by this reality. An increased appetite is usually more apparent in the third and fourth weeks of rehabilitation.

Snack times take place in the mornings between breakfast and lunch and then in mid-afternoon between lunch and dinner. Snacks usually consist of a piece of fruit, for example, bananas, pineapple, watermelon, oranges, etc. Sometimes they may be given whole grain cookies or crackers.

Children are also given water or oral re-hydration fluids, both on demand and ideally at two-hour intervals.

Cow’s milk is best avoided in the early stages of nutritional rehabilitation. It has been observed
here that children tend to suffer more diarrhea episodes when they are ingesting the milk from cows. As their bodies gain strength and their digestive system becomes more accustomed to processing foods, half-strength milk can be administered as tolerated.

Soy milk has been the best alternative to cow’s milk in the experience of the PAHS NRH staff. Soybeans are a well-documented excellent source of plant protein. Recovering children digest the drink produced from the soybean more readily.

(Editorial Note: The principles outlined here are applicable anywhere in the world carefully utilizing available, culturally acceptable foods. Soybeans and brown rice are widely available as excellent, highly nutritional staples. Where these are not available or accepted, other nutritious, culturally accepted foods must be utilized.) (See Section VI, chapter 2A for guidance)

1. Foods to comfort and nourish

a. Red beans and corn tortillas

A typical meal at the Nutrition Hospital is made up of ground red beans (a local staple), with a few soybeans added for extra high protein content, corn tortillas, a hard-boiled egg, and a small piece of white cheese with a glass of soy milk, or whole grain cereal based drink. Vegetables are served to the children, generally cooked in a vegetable soup and served with rice and corn tortillas. Vegetables such as carrots, string beans, and squash can also be cooked with rice.

Little children who are growing up in poverty are not accustomed to a wide variety of strange foods. Theirs is a simple palate of readily available nutritious plants. A typical meal in the homes of the humblest agrarian workers consists of red beans, corn tortillas, yucca (a starchy root), and sometimes rice. If the family owns a chicken, they may occasionally get eggs a couple of times during the week.

The patients of PAHS are generally the children from homes where their father works the land growing corn and red beans. Therefore, corn is usually the last item to disappear from the family
diet. Since corn, by itself, fails to meet protein nutritional requirements, protein deficient malnutrition (kwashiokor), is more generally more prevalent than calorie deficient malnutrition (marasmus) among these people.

The most cost-efficient foods are usually the most culturally accepted as well. In the Honduran culture, red beans, corn tortillas, plantains, bananas, and yucca are the most readily available foods. When treating malnutrition it is ideal to use foods with which the person suffering from malnutrition is already familiar. Many patients in a malnourished state have lost their appetite. For this reason, palatable and familiar foods are some of the best to fill the need.

Beans, no matter their variety, are best served to small children already ground up. This will ensure that all of the essential nutrients contained in them will be available to the child's growing body in spite of their limited ability to chew them properly.

b. Brown rice

Brown rice is an excellent source of nutrients. The challenge is to cook it in a way that is palatable to the child recovering from malnutrition. Many have never seen such a thing and will not eat it if they think it is supposed to be "rice." However, creative cooking can make it more pleasing to the taste buds and to the eye. Brown rice can be disguised in the form of patties that are prepared with egg and baked or fried and covered with a tasty sauce. This will work best if it has the appearance, as well as taste, of something that is familiar to the child.

In the NRH at PAHS, patients are offered parboiled brown rice. By doing so, nutrients are preserved, and the rice has the appearance of the culturally accepted white rice, making it easier to serve to willing recipients.

c. Soybeans

In the region that PAHS serves, protein deficiency is prevalent. Since soybeans are an excellent source of protein, they are made an important part of the rehabilitation diet. At the NRH they are mixed with the widely favored red bean to provide a more complete protein dish. Children,
whether young or older, do not normally accept soybeans by themselves.

Fortunately, soybeans may also be prepared in various creative ways for wider acceptance. Products such as soy milk, tofu, and ground soybean dishes are all fairly easy to make, and are readily accepted by the children. They are gaining more cultural acceptance in the local community as well.

To make these soy products: boil the beans, grind them up, wash them after grinding, and boil this water—this is the milk. The left over ground-up soybean can be mixed with string beans, tomato, and onion to make a rather tasty dish. As an alternative, tofu may be prepared.

Soybeans are grown on the PAHS farm, but since they have a tendency to be more “fragile” than the red bean, their growth must be closely supervised.

In an effort to capitalize on the nutritional benefits of the soybean, Dr. Youngberg developed a recipe for whole wheat bread that includes sesame butter, soy flour, freshly ground wheat and enriched wheat flour with added wheat bran. The main idea is to have nutrient dense bread.

d. Commonly grown vegetables and fruits

The commonly grown vegetables in the local culture are cucumber, carrots, radishes, cabbage, onions, and tomatoes. Patastillo (a vine grown vegetable known in other parts of the world as chayote) is very popular and grows quite profusely. Plantains are also very popular and nutritional. They contain many nutrients such as iron, calcium, vitamins A, C, E, niacin and folic acid. Green bananas are often also used as a vegetable, either boiled or fried. Beets and potatoes, too, are readily available and very popular.

Other vegetables newer to the local culture that are growing in acceptance are squash, garlic, and string beans. White potatoes are very popular and are available throughout the region, though they can only be grown in the colder areas of the country. Sweet potatoes are also available, but though they are a wonderful source of essential nutrients, containing some protein as well as vitamin A, they are not as popular as white potatoes.
Fruits that are easy to acquire are bananas, oranges, pineapples, papayas, cantaloupe, watermelon, and Japanese apples.

Seasonal fruits are mango, leeches, plumbs, apples and avocados.

2. Supplements

a. Vitamin B

Vitamin B 12 and B complex are administered by injection on a weekly basis to children during the acute phase of malnutrition. These vitamins appear to aid the ability of the body to recover from the severe nutrient deficiency, to speed the recovery of the malnourished child, and to hasten a healthy weight gaining process.

If the child is not in a severe state of malnutrition then orally administered vitamins are preferred. It is best to give a pleasant tasting vitamin that can be turned into a fun morning activity for the child.

A food that is very high in B vitamins is nutritional yeast. This can be made into a tasty paste adding olive oil, lemon juice, and water and spread onto bread or used as dip for tortillas or plantains.

b. Vitamin A

An essential vitamin to meet the growing needs of a child is Vitamin A. Among other things, this vitamin is vital to the health of a child’s eyes. Without Vitamin A, a child’s night vision grows poor. With increasing deficiency, corneas dry out and ultimately eyesight is lost.
Where it is doubtful that vitamin A rich foods are part of the diet. it is imperative that children be given an oral supplement at six-month intervals.

Yams, sweet potatoes, and carrots are good sources of vitamin A that can be added to the diet of any child. Care should be taken to present these in a palatable and pleasing way so that eating them appears fun.

c. Iron

Depending on the degree of anemia that accompanies the malnutrition, children may also need to receive injections of iron deep into the muscles. A trained professional who is acquainted with the technique for administering these supplements is essential to reduce complications.

A very practical way of getting iron into the diets of small children is to feed them raisins. Raisins can be mixed in with rice, shredded carrot salad; or can be given plain as a snack.

Leafy green vegetables, most beans, molasses, and whole grains are also high in iron.

3. Making eating fun for children

a. Cooking according to culture

The PAHS kitchen is centered around a traditional comal (a wood-burning flat metal topped stove) on which the cooking is done.
Some children are so used to eating corn tortillas that they insist on having them at every meal.

b. Rally festival prior to meals

Mealtime can be a lot of fun. Songs can be sung, a prayer said. At the NHR a tradition was started by Dr. Youngberg to get the children excited about mealtime and eating. It consists of the following game. An animated adult or teen will sing out “who likes beans?” to which the children will respond: “me!” Then, “Who likes tortillas?” Another chorus of “me!” rings out, and so forth. After getting all the way through a list of that particular meal’s menu items, chants for the foods on the menu are sent into the air, all in anticipation of the meal being brought to the table. So by the time the meal arrives there is great anticipation and excitement.

Once the meal is served, however, the dining hall quickly quiets down as all little mouths become occupied with the serious business of eating.

Eating should not be a battle of wills. If a child refuses to eat, the adult caretaker should not engage in forcing them to eat. Rather the child should be distracted or offered a favorite food mixed into the other nutritious food.

c. Combining outings with fruit eating

A favorite outing of the recovering child consists of going on walks to the fruit orchards. This is a fun activity that gets them out of the hospital and into nature. The reward at the end of the walk is that they get to pick (if they are healthier) or be given fruit to eat. This combines the physical activity of walking and climbing a tree with the important activity of eating. It also provides very fresh fruit in a natural setting and lots of fresh air to breathe.
4. Elimination of poor nutrition

a. Remove soda and junk snacks from availability

Occasionally a child becomes malnourished because he/she has been given the wrong types of foods. Often, well-meaning parents who are unaware of the concept of “empty calories” or “junk food” provide processed and packaged snack foods, cookies, crackers, and soda pop. They are unaware that these foods, far from being of benefit to their child, are expensive (as compared to natural food items), harmful in that they rob the child of the appetite, and thereby often take the place of more nutritious foods.

Parents should be educated regarding the harm done to children by junk foods and sugary drinks. They should be advised to remove them from availability so that children can develop a healthy appetite that will naturally lead them to desire good food.

If parents ensure that junk foods are not available to children, then they will naturally get hungry and eat nutritious food.

b. Be vigilant about PICA

Some children who have experienced a nutritional deficiency are prone to eat dirt, foam, coffee grounds, or other non-food items. In a child recovering from malnutrition this must be closely guarded against as it can potentially sabotage the recovery period.

In a child with severe anemia one should investigate whether the child has been eating dirt.
D) The environment of rehabilitation

1. Homey atmosphere

a. Hygienic and clean—not aseptic

During the rehabilitation of malnourished children, it is important to keep a friendly and homey atmosphere about the hospital. Many have come from homes where the floors are made of compacted dirt. Others have come from very humble homes where survival is a daily struggle and the surroundings are basic, four walls and a roof. Often those walls are made of sticks that allow wind to whistle through and the roof is thatch or very old tin with many holes that allows rain water through.

It is important to keep a very clean and hygienic environment, especially because health is being promoted and the best way to teach is by example. However, an aseptic environment is not desirable since it would alienate parents, making hygiene appear rigorous and unattainable—and it would give children a feeling of isolation in an unfamiliar environment.

b. Sights and smell of home

A very important component of mealtime is the way that the foods are being prepared in the kitchen. The taste and smell of home is considered to lend comfort and added appeal to small children away from home for the first time in their short lives.

2. Family style setting

An important aspect of speedy recovery for the patients of the NRH is that their rehabilitation takes place in a family-style setting with people of all ages that they can see and relate to on a daily basis.
a. Older healthy children

At PAHS there is also a home for older children who live permanently on the campus. The majority of these older school-aged children have at one time been in the nutritional rehabilitation program themselves.

These children are very loving and feel a great deal of compassion for the younger ones who are recovering from the illness of being hungry. They visit daily and play with the little ones and also help to care for them. The little children grow to have a sense of having siblings around, perhaps like they do at home.

b. Care takers

The daily caretakers—known locally as turnadoras—are parents themselves, and so naturally have the maternal care-giving instinct. They are trained in basic medical knowledge and work closely with a professional nurse and/or a physician. They are with children around the clock.

Caretakers are selected for their compassion, as well as for the competency in caring for their own children.

3. All ages from toddlers to elders

The PAHS campus is a community made up largely of children, but which also has a number of adults. Young, middle aged, and a few older adults all are part of daily life on campus. The contact that the varying age groups have with each other makes for a feeling of extended family and all give more support to the healing qualities of the environment.

4. Tender loving care
As children are far from their homes for the first time in their short lives, it is of utmost importance to demonstrate kind compassion to them through smiles, hugs, words of endearment, and comfort as well as holding them close. Love is a great motivator toward wellness and healing, and is a very important part of the recovery process.

a. Freedom

Recovering children are given the freedom to roam around within reason. As long as they have a caretaker’s watchful eye they are given the freedom to explore their surroundings as they see fit.

As a child recovers his/her strength and finds a will to live returning, it is important to support their sense of adventure and curiosity by allowing them the freedom to be individuals and to see their surroundings personally and up close.

5. Surrounded with nature

a. Trees

Besides cooling shade, trees provide purified air as well as a place for children to play. On the campus of PAHS, trees are a great source of fun. Children can climb the fruit trees (preferably supervised by an adult) to pick fruit, or merely for recreation. Swings can be hung from trees as well. An old tire hung up by a strong rope in a tall tree can be a means of many hours of recreation.

The benefits of tree climbing are varied and include providing a child with a goal oriented task to complete and exercise, as it is an outdoor activity that requires strength, ingenuity, and endurance.
b. Fresh air

Fresh air is important in the recuperating process of a sick child. It provides oxygen that is essential for the body to recuperate and process the essential nutrients being used in the growth process.

Good ventilation of rooms and buildings, as well as many and varied outdoor activities help to boost the intake of fresh air.

c. Sunshine

The sun's rays aid in the synthesis of vitamin D and therefore are a great ally in the recuperation of malnourished children. It is important that children be supervised when taking in the sun, being careful not to be exposed to the stronger rays between mid-morning and mid-afternoon (approximately between 10 am–2 pm).

Rooms that have ample windows for sunlight to come in are ideal as exposure to sunlight also helps to cut down on indoor bacteria, mold and other pathogens.

d. Physical activity

It is ideal to allow children to play as much as they wish to. When they are recovering from serious illness their energy levels are understandably low. It is important for children who are ill and on their way to recovery to be exposed to watching other children playing and having fun. This motivates the ill child towards recovery as they have something to look forward to when they are feeling better.

Playgrounds, small indoor slides, tricycles, and other toys that provide an opportunity for physical activity are wonderful for encouraging children to use their energy to strengthen their physical endurance.
6. A farm  (see Section VI, chapter 3C for more information about gardening)

a. Provides nutritious foods—“tailor made”

Being able to grow basic grains and vegetables is of great benefit for treating the results of hunger. Knowing what has gone into the soil, as well as the quality of seeds has the added advantage of having confidence in the quality of what is being served at mealtimes.

The Farm of PAHS grows corn, red beans, soybeans, and a variety of vegetables. Throughout the year these crops produce food that is cooked and consumed on the NRH campus and in the PAHS homes.

The cooks provide a list of vegetables that they need to prepare meals with, and the gardeners then are able to tend their crops according to the desired products. The farm also produces fresh milk from dairy cows for consumption in the NRH.

A cash crop of sugarcane is kept, which provides two very important components to the over program of PAHS. It provides a respectable source of income in the summer when operating funds normally run low, and it provides an endless source of recreation for older children who love to “chupar caña” chew and suck fresh sugarcane. Contrary to what some may think, sugarcane does not contribute to tooth decay, and it actually can serve to “brush” some plaque off the teeth.

b. A source for object lessons

The gardens and crop fields also provide ample opportunities for object lessons for the children. It is therapeutic for people to learn to tend to plants as well as to watch seedlings grow and know that their efforts aided this growth process.
Gardening has also been used as a competition to see which older child can keep the neatest and most productive garden. Boys from the home were once motivated to grow as much as possible as they got to sell their vegetables and keep half of the profits. This taught them about entrepreneurship, in addition to teaching about how to tend to other living things and stewarding resources.

c. Character-building work & chores

Being responsible for living things builds character in children. Working in a garden is also a source of recreation.

Children learn to be industrious and can learn good work habits from tending a garden.

It is important to point out that in gardening there can be no “cheating.” What you plant is what you produce. What one sows one also reaps. And the effort put into the garden patch is rewarded accordingly as well.

7. A chapel

The chapel is a prominent building on the campus and represents a main component to the healing ministry that is taking place on the premises of PAHS.

a. Christian environment

Central to the recovery of a malnourished child is singing songs and praying. Children are taught about the love of Jesus and told stories from the Bible.

Sharing, often an innate characteristic of underprivileged children, is encouraged.
Kindness shown to the less privileged is promoted.

b. Trust in God

Children are taught to pray because reliance on God is of great importance. Children are taught that God provides for all our needs and that He cares about what is important to them.

They are encouraged to talk to God as to a friend. They are taught to ask for what they need, and to thank Him for the things they have that they feel are good and which they feel happy about.

E) Medical support

1. Screening for malnutrition

a. General signs and symptoms

A child with malnutrition will appear quite sad and will lack energy. They will have a lack of skin color and the skin will appear somewhat dry and often blotchy. The upper arms will appear thin between the shoulder and elbow. The eyes often appear glassy and very sad. Without their shirt on one can notice the protrusion of the ribs and usually a prominent belly.

Kwashiokor, also known as “wet malnutrition,” is a general deficiency of protein in the body. It is caused by a limited intake of protein in the diet. As a result of this protein deficiency, fluid accumulates in the tissues of the feet, legs, arms, or face so that these children will have a swollen appearance in one or more of these areas.
Marasmus, also known as “dry malnutrition,” is a general deficiency of nutrients. It is caused by severe limitation of food intake (not just a lack of protein), This in turn causes the general wasting of the fat stores, as well as muscle tissue. The child with Marasmus is easily identified by their skeletal appearance.

(Editorial Note: The distinction between Kwashiokor and Marasmus is not always clear by clinical appearance)

b. Growth and development needs for protein

The lack of adequate protein in the diet of a growing child is a serious problem. The body of a growing child needs sufficient protein to build new tissues, but it also needs protein to sustain life and promote health. Protein and calorie deficient children are therefore much more prone to disease and infections.

c. Molars for proper chewing

It should be noted that toddlers do not yet have a full set of teeth and lack molars to chew food properly. Especially in countries where beans and corn are staples this should be taken into account. These types of foods should be ground up so that all nutrients will be readily available to the organism of a growing, small child.

d. Ruling out other causes of edema or extreme thinness

When screening a child for malnutrition, it is of utmost importance to keep in mind that a child who appears to be exhibiting signs of malnutrition could be experiencing some other disease process. For this reason it is ideal that a child suspected of being malnourished be examined by a trained medical professional to rule out other serious and life-threatening illnesses.

Acute kidney failure can be mistaken for kwashiokor and precious days can be lost treating
malnutrition when in actuality, immanent or actual kidney failure is placing the child’s life at risk.

Tuberculosis and acquired Immune deficiency syndrome (AIDS) can also cause the same appearance as marasmus, and both must be diagnosed as soon as possible to place the child under the proper treatment regimen as soon as possible.

2. Common illnesses in malnutrition

Some diseases go hand in hand with a malnourished state. Since the body does not have enough nutrients for building new cells, the immune system suffers and cannot adequately fight off infections and opportunistic diseases.

a. Diarrhea  (Section III, chapter 4, S for more information)

The number one killer of children worldwide is still diarrhea, most often associated with malnutrition as a vicious cyclic process of malnutrition—diarrhea—malnutrition—diarrhea, etc., etc.

Management must begin with improving nutrition.

b. Parasites  (See Section VII, chapter 9, Y, 5, e for natural remedies)

Intestinal parasites go hand in hand with malnutrition. Often children are from the poorest families that do not have proper hygiene in their humble dwelling places. The larvae of intestinal parasites can gain access to the body by inadvertent ingestion by mouth or by penetration through the skin of bare feet.

Intestinal parasites can cause great damage as they siphon off much needed blood. An already
malnourished child that has anemia because of lack of proper cell-building nutrients has a compounded problem because parasites are absorbing part of the blood supply that is already compromised from lack of nutrients.

Certain parasites can also attack major organs—including the brain.

Prevention is the best antidote to this problem. Keep shoes or sandals on small feet. Encourage the use of latrines. Teach children hand washing with soap. Keep small fingernails trimmed to avoid a reservoir for parasite larvae under the nails. Bathe only in clean, clear water. Wash fresh fruits or vegetables well. Avoid eating pork. Ensure that any meat that is eaten will be very well cooked.

Lice are parasites which also suck blood from the scalp. Lice often, but not always, can be found in children who are suffering malnutrition. For this reason children must screened for this and their hair thoroughly washed.

c. Skin diseases  (See Section III, chapter 13)

Other common opportunistic infections can affect the skin. The most common in the area where PAHS serves is scabies. Other skin infections are bacterial infections such as impetigo, and fungal infections such as ringworm or empeines.

These conditions must be treated or they will persist. When treating scabies, clothing and bedding must be washed and treated with boiling water. A medication for eliminating scabies must be used on skin as directed by a medically trained person (Section III, chapter 13, K).

Bacterial and fungal skin infections must also be treated with the appropriate medications for each condition (Section III, chapter 13).
3. Medical personnel

It is important to have a medical professional available for the care of malnourished children. A physician and nurse are the ideal team for the care of ill children. Where a physician is unavailable it is of great importance to have a trained nurse to supervise their progress and make appropriate referrals to physicians as needed.

Health assistants can be trained in basic care and be taught the warning signs to report to a medical professional

F) Preventing malnutrition in children from low income families

1. Promoting health

Against the daunting backdrop of the common causes of ill health and specifically childhood malnutrition, there is still hope of finding creative solutions for promoting health among the very poor. Available foods can be used to prevent malnutrition and to ensure growth and development. Likewise, hygienic practices can be taught to willing parents, and food can be offered to supplement their need.

a. Teach nutritious food combinations—(Get a copy of a local cook book)

Using commonly available and culturally acceptable foods, it is possible to teach parents how to prepare meals that are balanced in essential nutrients for the optimal growth of their children.

In Honduras, the Ministry of Health, aided by international organizations, has developed an educational curriculum that is based on readily available foods that can be easily prepared and fed to children in order to keep them from falling into a malnourished state.
Chapter 4 - Child Nutrition

The challenge is to get these teaching resources disbursed among the populations who can benefit most from them.

b. Hygienic practices  (See Section IX, chapter 4 for more suggestions)

Parasitic diseases that accompany malnutrition can be combated by improved hygienic practices.

Teaching must be done about keeping dwellings swept clean and surfaces inside the home wiped free of dust and dirt. The importance of hand washing must be emphasized whenever possible. Daily bathing should be advocated wherever this is feasible according to available water supply.

Latrine use should be promoted and the importance of keeping human waste away from pets and children should be made very clear and repeated often.

It should also be taught that pigs and dogs carry many diseases and that these, if they are kept at all, should be penned or tied up in a clean area and should not be allowed to wander where small children are allowed to play. This will keep certain, very serious parasites out of the systems of small children.

Teach parents to trim fingernails of their children and to keep their feet covered whenever possible even if just by a pair of simple sandals.

c. Inform about the growth cycles of small children

Parents should be informed of the how their children grow and the needs that they will experience through some very specific and predictable growth spurts.
They should be taught why their children’s appetite fluctuates according to growth needs and the fact that their children’s teeth have an impact on their ability to chew foods.

The increased need for proteins should be emphasized, along with how to best get this very essential nutrient into their diets in a palatable way.

d. Basic education and literacy

In order to provide a better life for their families, people living with poverty need a basic education and the skills that this can provide them, most important among them being, how to read, write, and count.

Without a basic education, many living in poverty will only repeat the cycle of poverty and illiteracy over and over again.

In order to break out of the poverty cycle, education is imperative. People who have a technical skill and/or a basic profession are well on their way to breaking out of the poverty cycle indefinitely.

With education come the tools to stay well and to keep children from falling into a vicious cycle of ill health and poor growth and development.

e. Provide meals

Many times, in spite of the fact that teaching has been done and parents are aware of the needs of their children, children will be malnourished anyway.
Chapter 4 - Child Nutrition

Therefore, at times it will be necessary to provide meals for children or families who are still struggling to stay well.

By cooking with, and providing meals for, people in great need one can serve in two ways. Meet the immediate need for nourishment and provide a hands-on example to them of how to prepare a good, nutritious meal.

G. Follow up of Rehabilitation

1. Going home

Surprisingly, many patients do not wish to go home once they have recovered from their illness.

Criteria for going home typically includes reaching the expected growth norm on a standard growth chart, gaining a proper weight, being robust and energetic, and exhibiting appropriate motor skills and appropriate cognitive responses.

Parents are advised to feed children easily digestible foods. Often this includes instructions to grind hard-to-chew foods like beans and corn. It is best to teach the parents ideal sources of protein and to tell them what has been observed about their child during his/her stay—such as particular likes and dislikes and special skills and aptitudes the child has exhibited. The parent is asked to bring the child back should he/she begin to exhibit any problems. Permission to visit the child in his/her home is often requested as well.

Follow-up in the home is ideal whenever or wherever this is feasible. Sometimes the home situation is such that it contributes to the illness of children. Hygiene or social situations must be noted and approached in a sensitive manner so as not to offend, keeping in mind that the ultimate goal is the optimal health of all family members, but especially the smallest, most vulnerable ones.
2. Preventing relapses

a. Careful instructions

In order to prevent relapses, it is important to give careful instructions appropriate to the understanding of the parents. By using the illustration of the child's ill state of health during the crisis as a health promoter, one can draw contrast and comparison analysis to help the parents understand how the malnourished state came about, how it was treated, and how to keep their child in a healthy state by applying the same principles used to treat the child. Nutritious food, a hygienic environment, appropriate vitamin supplements, and ample opportunities to rest as well as to play must be part of the ongoing health plan.

b. Education to break the cycle of poverty and hunger

Parents who have struggled against the malnutrition of their children should be encouraged to seek a basic education not only for themselves, but also for each of their children in order to ensure that all have a reasonably good opportunity to remain healthy long-term.

Seeking out or providing for them access to adult literacy programs is a great way to give poor families a new start on the road to improved health, not only in body, but also in lifestyle.

Learning to read, write, and count is critical in the life of people struggling to escape the ills of poverty.

Being taught the basics in childcare, nutrition and signs of disease is also critical in helping poor families stay as healthy as possible. The importance of education is crucial to the fight against poverty, hunger, and malnutrition.

An educated mother or father is less likely to go for a long time without recognizing that their child's health is in great danger. Educated parents will know the basic elements of providing
nutritious foods for their children. They will realize when their child is not meeting the generally expected growth and development milestones.

Even where it is not possible for parents to get a prolonged and formal education, it is imperative that a basic and even informal training be made available if malnutrition is to be combated.

c. Supporting the family’s desire to improve

Many families do not relish the thought of remaining in the desperate condition that they find themselves in. Often they have ideas of how life could improve for them. It is possible to discover these dreams and to support them in creative ways.

Perhaps a bank of resources could “lend” certain entrepreneurial-minded parents the raw materials needed to establish a micro-industry that could lead to an improved lifestyle. (One possibility is the Grameen Foundation, originally established in Bangladesh by Mohammad Yunus to make small loans to poor people to begin a business. Information may be obtained on the Internet.)

Joining creative and enterprising organizations like Project Heifer in order to pass along resources in livestock can also help to provide an opportunity for improvement in a poor family’s life condition.

It is of course important to find out what the ideas of the target population are and to help support them in finding ways to carry these ideas out wherever they are feasible.

SUMMARY

Hunger is a worldwide problem that effects most drastically the health of young children who can very quickly become malnourished when essential and balanced nutrients are not available
Malnutrition can be treated by carefully planning meals with the readily available and inexpensive foods that can be chosen for their natural content of nutrients and served in a way as to maximize the benefits of their nutritious content.

The success of the Nutrition Rehabilitation Program of Pan American Health Service in Honduras is based on kind nurturing in a Christian atmosphere, generally accepted medical practices, natural surroundings, and a diet that is culturally accepted.

Education—both the formal basic type and the informal training type—is essential for the prevention, treatment, and long-term success of the fight against malnutrition.